



## RoHS/RoHS2/RoHS 3 Statement

Date: July 22, 2019

Dear Valued Customer:

Thin Film Technology, an ISO 9001 registered company, manufactures and sells passive electronic components. This letter outlines the current RoHS/RoHS2/RoHS3 compliance status for the products that we manufacture and distribute.

**Products which are RoHS/RoHS2/RoHS3 Compliant and Lead Free (Comply to Directive 2002/95/EC, 2011/65/EU and (EU) 2015/863):**

<b>Product Type:</b>	<b>Series (first 2-4 digits of the MPN part numbers):</b>
Chip Resistor	AS, AF, CR, KN, RN73, RR, RT, TF, *TFG
Chip Capacitors/Networks	CAA, CAC, CAL, CGL, CLP, CNM, CRF, CST, CNM
Chip Power Resistors	CFA, CPA1206, CPA2512
Chip Attenuator	PAT, ATT, ATV, HPA
Resistor Networks	RA, RN, RM
Power Splitters	PS
Electrical Filters	FL, FBB, FBP, FHP, FLP
Signal Integrity Products	EF, XO
Current Sense	CPA, CPC, CPP, LPC, MPA, MPC, RL, WEL, WKL, WRL

**Products which are RoHS/RoHS2/RoHS3 Compliant utilizing exemption 7.C.I (Comply to Directive 2002/95/EC, 2011/65/EU and (EU) 2015/863):**

<b>Product Type:</b>	<b>Series (first 2-4 digits of the MPN part numbers):</b>
Chip Resistors	TFA, TFGL, TFH, TFHV, TFM, TFP, TFQ, TFS, TFUV, TFV, TFAS
Current Sense	TFEL
Resistor Networks	TRA, TCA, TRN, TWA

*\*Note 1)* With the exception of the TFG Series TFT Thick Film Resistors which contain Lead under the permission of RoHS exemption 7(C)-I: Electrical and electronic components containing lead in a glass or ceramic other than dielectric ceramic in capacitors, e.g. piezoelectric devices, or in a glass or ceramic matrix compound.



## Products and Packaging Materials Free of Certain Banned Substances

This document certifies on behalf of Thin Film Technology Corporation that, except for lead or other noted exceptions, to the best of Thin Film Technology's knowledge the substances listed below are not present in Thin Film Technology's products or packaging materials.

- ozone depleting substances
- mercury or mercury compounds (1)
- cadmium or cadmium compounds(1)
- hexavalent chromium(1)
- lead (1) (2)
- polybrominated biphenyls (pBBS) and diphenyl oxides/ethers (PBDOs/PBDEs)
- polychlorinated biphenyls (PCBs) and terphenyls (PCTs) and naphthalenes
- Bis(2-ethylhexyl) phthalate (DEHP)
- Butyl benzyl phthalate (BBP)
- Dibutyl phthalate (DBP)
- Diisobutyl phthalate (DIBP)
- chlorinated aliphatic and aromatic compounds, including pentachlorophenol and related compounds
- organo-tin compounds
- asbestos
- azo compounds
- ethylene glycol ethers and related compounds
- formaldehyde
- phthalates
- PVC
- Tetrabromobisphenol A
- FR720
- radioactive substances

The following tables represent examples of chemicals from the above list that are used in TFT's Industry.

### Mercury or mercury compounds (1)

Name	CAS No.	Chemical Formula	TFT Use
Mercury	7439-97-6	Hg	None
Mercury (I) Chloride	10112-91-1	Hg <sub>2</sub> Cl <sub>2</sub>	None
Mercury (II) Chloride	7487-94-7	HgCl <sub>2</sub>	None

### Cadmium or cadmium compounds(1)

Name	CAS No.	Chemical Formula	TFT Use
Cadmium	7440-43-9	Cd	None
Cadmium alloys	--	--	None
Cadmium oxide	1306-19-0	CdO	None
Cadmium chloride	10108-64-2	CdCl <sub>2</sub>	None
Cadmium sulfide	1306-23-6 8048-07-5	CdS	None
Cadmium nitrate	10325-94-7	Cd(NO <sub>3</sub> ) <sub>2</sub>	None



## Hexavalent chromium(1)

Name	CAS No.	Chemical Formula	TFT Use
Chromium (VI) oxide; Chromium trioxide	1333-82-0	CrO <sub>3</sub>	None
Potassium Chromate	7789-00-6	K <sub>2</sub> CrO <sub>4</sub>	None
Calcium Chromate	13765-19-0	CaCrO <sub>4</sub>	None
Strontium Chromate	7789-06-2	SrCrO <sub>4</sub>	None
Barium Chromate	10294-40-3	BaCrO <sub>4</sub>	None
Lead Chromate; chrome yellow	1344-37-2	PbCrO <sub>4</sub>	None
Zinc Chromate	12018-19-8, 13530-65-9; 14018-95-2	ZnCrO <sub>4</sub>	None
Sodium dichromate; sodium bichromate	10588-01-9	Na <sub>2</sub> Cr <sub>2</sub> O <sub>7</sub>	None
Potassium dichromate; potassium bichromate	7788-50-9	K <sub>2</sub> Cr <sub>2</sub> O <sub>7</sub>	None
Ammonium dichromate; potassium bichromate	7789-09-5	(NH <sub>4</sub> ) <sub>2</sub> Cr <sub>2</sub> O <sub>7</sub>	None
Zinc dichromate; zinc bichromate	--	ZnCr <sub>2</sub> O <sub>7</sub>	None

## Lead (1) (2)

Name	CAS No.	Chemical Formula	TFT Use
Lead; metal	7439-92-1	Pb	Sn/Pb Solder
Lead / Tin Alloy	--	Pb-Sn	Sn/Pb Solder, Sn/Pb Spheres
Lead (II) oxide <i>*See Note on Page one</i>	1317-36-8	PbO	Resistive Layer
Lead (IV) oxide	1309-60-0	PbO <sub>2</sub>	None
Lead (II, IV) oxide	1314-41-6	Pb <sub>3</sub> O <sub>4</sub>	None
Lead (II) fluoride	7783-46-2	PbF <sub>2</sub>	None
Lead fluoroborate	13814-96-5	Pb(BF <sub>4</sub> ) <sub>2</sub>	None
Lead fluosilicate	25808-74-6	PbSiF <sub>6</sub>	None
Lead hydroxycarbonate	1344-36-1	(PbCO <sub>3</sub> ) <sub>2</sub> Pb(OH) <sub>2</sub>	None
Lead (II) Sulfate	7446-14-2, 15739-80-7	PbSO <sub>4</sub>	None
Lead oxide sulfate	12202-17-4	Pb <sub>4</sub> SO <sub>7</sub>	None
Lead antimonite	13510-89-9	Pb <sub>3</sub> (SbO <sub>4</sub> ) <sub>2</sub>	None
Lead Chromate; chromate yellow	1344-37-2	PbCrO <sub>4</sub>	None
Lead molybdate	10190-55-3	PbMoO <sub>4</sub>	None



### Polybrominated biphenyls (pBBS) and diphenyl oxides/ethers (PBDOs/PBDEs)

Name	CAS No.	Chemical Formula	TFT Use
Polybromodiphenyl ether; polybromodiphenyloxyde; polybrominated buphenyl ethers; PBDE; PBDO; PBBE	--	C <sub>12</sub> H <sub>10-x</sub> Br <sub>x</sub> O (x = 1 - 10)	None
Decabromodiphenyl ether; decabromodiphenyloxyde; DBDPE; DBOPO	1163-19-5	C <sub>12</sub> Br <sub>10</sub> O	None
Octabromodiphenyl ether; octabromodiphenyloxyde	32536-52-0	C <sub>12</sub> H <sub>2</sub> Br <sub>8</sub> O	None
Hexabromodiphenyl ether; hexabromodiphenyloxyde	36483-60-0	C <sub>12</sub> H <sub>4</sub> Br <sub>6</sub> O	None
Pentabromodiphenyl ether; pentabromodiphenyloxyde	32534-81-9	C <sub>12</sub> H <sub>5</sub> Br <sub>5</sub> O	None
Polybrominated biphenyls; PBB	e.g. 67774-32-7	C <sub>12</sub> H <sub>10-x</sub> Br <sub>x</sub> (x = 1 - 10)	None

### Polychlorinated biphenyls (PCBs) and terphenyls (PCTs) and naphthalenes

Name	CAS No.	Chemical Formula	TFT Use
PCB; polychlorinated biphenyls	1336-36-3	C <sub>12</sub> H <sub>10-x</sub> Cl <sub>x</sub> (x = 1 - 10)	None
Polychlorinated naphthalenes	--	C <sub>12</sub> H <sub>8-x</sub> Cl <sub>x</sub> (x = 3)	None
Trichloronaphthalenes	1321-65-9	C <sub>10</sub> H <sub>5</sub> Cl <sub>3</sub>	None
Tetrachloronaphthalenes	1335-88-2	C <sub>10</sub> H <sub>4</sub> Cl <sub>4</sub>	None
Pentachloronaphthalenes	1321-64-8	C <sub>10</sub> H <sub>3</sub> Cl <sub>5</sub>	None
Octachloronaphthalens	2234-13-1	C <sub>10</sub> Cl <sub>8</sub>	None
Short Chained Chlorinated paraffins C <sub>10-13</sub> , Cl ≥ 50 wt%	e.g. 85535-84-8	--	None

### Organo-tin compounds

Name	CAS No.	Chemical Formula	TFT Use
Triphenyl tin N,N'-dimethyldithiocarbamate	1803-12-9	(C <sub>6</sub> H <sub>5</sub> ) <sub>3</sub> Sn(CH <sub>3</sub> ) <sub>2</sub> NCS <sub>2</sub>	None
Tributyl tin sulfamate	6517-25-5	(C <sub>4</sub> H <sub>9</sub> ) <sub>3</sub> SnSO <sub>3</sub> NH <sub>2</sub>	None
Tributyl tin chloride	1461-22-9	(C <sub>4</sub> H <sub>9</sub> ) <sub>3</sub> SnCl	None

### Asbestos

Name	CAS No.	Chemical Formula	TFT Use
Asbestos	1332-21-4; 132207-32-0; 132207-33-1	--	None



### Ethylene glycol ethers and related compounds

Name	CAS No.	Chemical Formula	TFT Use
Diethylene glycol ethyl ether acetate	112-15-2	--	None
Triethylene glycol monomethyl ether	112-35-6	--	None

### Formaldehyde

Name	CAS No.	Chemical Formula	TFT Use
Formaldehyde; formalin; formaldehyde; formol	50-00-0	HCHO	None

### PVC

Name	CAS No.	Chemical Formula	TFT Use
PVC and PVC Blends; Polyvinylchloride and polivinylchloride blends.	e.g. 9002-86-2	--	None

### Antimony compounds

Name	CAS No.	Chemical Formula	TFT Use
Antimony	7440-36-0	Sb	None
Antimony Trioxide	1309-64-4	Sb <sub>2</sub> O <sub>3</sub> (or Sb <sub>4</sub> O <sub>6</sub> )	None

#### Notes:

- Naturally occurring and may be a trace impurity. To date, not detected at a 5 ppm method detection limit. See Note <sup>(2)</sup>.
- Standard products contain lead as an intentionally added constituent. Refer to table on page 2. Packaging materials and lead free products do not.

Any questions related to Thin Film Technology's compliance to the RoHS/RoHS2/RoHS3 directive can be directed to:

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Sincerely,

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