Manufacturing Restricted Substances List (M-RSL)

The following reflects Mango's international Manufacturing RSL detection limits as of 01 May 2016. These detection limits will be revised - at least yearly, to always reflect the lowest technically available detection limits.

Group	Substance	CAS-nr.	Detection Limit		Test Method		Limits
			Waste water / In-water (µg/l)	Sludge/ Chemical inputs (mg/kg)	Waste water	Sludge	Ban/ phase-out
1. Alkylphenols	Nonylphenol	104-40-5	1	0.2	With Reference To DIN EN ISO 18857 And Followed by Liquid Chromatography – Mass Spectrometry (LC-MS) Analysis. $NPEO_{(1+2)}$: GC/MS	Solvent extraction DIN EN ISO 18857 LC/MS mod, resp. $NPEO_{(1+2)}$: GC/MS	Banned
	Octylphenol	140-66-9	1	0.2			
	Nonylphenol ethoxylates 1+2 (NPEO 1+2)	Multiple	5	0.2			
	Octylphenol ethoxylates 1+2 (OPEO 1+2)	Multiple	5	0.2			
	Nonylphenol ethoxylates 3-18 (NPEO 3-18)	Multiple	5	0.2			
	Octylphenol ethoxylates 3-16 (OPEO 3-16)	Multiple	5	0.2			
2. Phtalates	Bis (2-ethylhexyl) phthalate (DEHP)	117-81-7	1	0.3	Toluene Extraction And Followed by Gas Chromatography-Mass Spectrometry (GC-MS) Analysis resp. LC/MS.	Extraction with toluene, GC-MS resp. LC/MS.	Banned
	Butyl benzyl phthalate (BBP)	85-68-7	1	0.3			
	Di-n-butyl phthalate (DBP)	84-74-2	1	0.3			
	Diethyl phthalate	84-66-2	1	0.3			
	Dimethyl phthalate	131-11-3	1	0.3			
	Di-n-octyl phthalate (DNOP)	117-84-0	1	0.3			
	Di-isononyl phthalate (DINP)	28553-12-0	1	0.3			
	Di-iso-decyl phthalate (DIDP)	26761-40-0	1	0.3			
	Di-isobutyl phthalate (DIBP)	84-69-5	1	0.3			
	Di-n-hexyl phthalate	84-75-3	1	0.3			
	Dimethoxyethyl phthalate (DMEP)	117-82-8	1	0.3			
	Di-n-propyl phthalate (DPRP)	131-16-8	1	0.3			
	Di-iso-octyl phthalate (DIOP)	27554-26-3	1	0.3			
	Di-cyclohexyl phthalate (DCHP)	84-61-7	1	0.3			
	Dinonyl phthalate (DNP)	84-76-4	1	0.3			
3. Brominated and Chlorinated Flame retardants *	Polybrominated biphenyls (PBBs)	various	-	-	By Toluene Extraction And Followed By Liquid Chromatography - Mass Spectrometry (LC-MS) And Gas Chromatography - Mass Spectrometry (GC-MS) Analysis.	Extraction with toluene, GC-MS resp. LC/MS.	Banned
	monobromo biphenyls (MonoBB)		0.05	0.3			
	Dibromo biphenyls (DiBB)	-	0.05	0.3			
	Tribromo biphenyls (TriBB)	-	0.05	0.3			
	Tetrabromo biphenyls (TetraBB)	-	0.05	0.3			
	Pentabromo biphenyls (PentaBB)	-	0.05	0.3			
	Hexabromo biphenyls (HexaBB)	-	0.05	0.3			
	Heptabromo biphenyls (HeptaBB)	-	0.05	0.3			
	Octabromo biphenyls (OctaBB)	-	0.05	0.3			
	Nonabromo biphenyls (NonaBB)	-	0.05	0.3			
	Decabromo biphenyl (DecaBB)	13654-09-6	0.05	0.3			
	Polybrominated diphenyl ethers (PBDEs)	various	-	0.3			
	Monobromo diphenyl ethers (MonoBDE)	-	0.05	0.3			
	Dibromo diphenyl ethers (DiBDE)	-	0.05	0.3			
	Tribromo diphenyl ethers (TriBDE)	-	0.05	0.3			
	Tetrabromo diphenyl ethers (TetraBDE)	40088-47-9	0.05	0.3			
	Pentabromo diphenyl ethers (PentaBDE)	32534-81-9	0.05	0.3			
	Hexabromo diphenyl ethers (HexaBDE)	36483-60-0	0.05	0.3			
	Heptabromo diphenyl ethers (HeptaBDE)	68928-80-3	0.05	0.3			
	Octabromo diphenyl ethers (OctaBDE)	32536-52-0	0.05	0.3			
	Nonabromo diphenyl ethers (NonaBDE)	63936-56-1	0.05	0.3			
	Decabromo diphenyl ether (DecaBDE)	1163-19-5	0.05	0.3			
	Tris(2,3-Dibromopropyl)-Phosphate (TRIS)	126-72-7	0.5	0.25			
	Tris(2-hloroethyl)Phosphate (TCEP)	115-96-8	0.05	0.25			
	Hexabromocyclododecane (HBCDD)	134237-50-6, 134237-51-7, 134237-52-8, 25637-99-4, 3194-55-6	0.5	0.25			
	Tetrabromo-bisphenol A (TBBPA)	79-94-7	0.5	0.25			
	TEPA	545-55-1	0.05	0.25			
4. Azo dyes	1,4-Phenylenediamine	106-50-3	0.1	0.1	With Reference To EN 14362:1&3 And Followed By Gas Chromatographic – Mass Spectrometric (GC-MS) And High Performance Liquid Chromatographic (HPLC) Analysis.	EN 14362 modified GC/MS resp. HPLC.	Banned
	2,4,5-Trimethylaniline	137-17-7					
	2,4-Diaminoanisole	615-05-4					
	2,4-Diaminotoluene	95-80-7					
	2,4-Xylidine	95-68-1					
	2,6-Xylidine	87-62-7					
	2-Chloroaniline	95-51-2					
	2-Naphthylamine	91-59-8					
	3,3'-Dichlorobenzidine	91-94-1					
	3,3'-Dimethoxybenzidine	119-90-4					
	3,3'-Dimethyl-4,4'-diaminodiphenylmethane	838-88-0					
	3,3'-Dimethylbenzidine	119-93-7					
	4,4'-Diaminodiphenylmethane	101-77-9					
	4,4'-Methylene-bis(2-chloroaniline)	101-14-4					
	4,4'-Oxydianiline	101-80-4					
	4,4'-Thiodianiline	139-65-1					
	4-Aminobiphenyl	92-67-1					
	4-Chloroaniline	106-47-8					
	4-Chloro-o-toluidine	95-69-2					
	5-Nitro-o-anisidine	99-59-2					
	5-Nitro-o-toluidine	99-55-8					

	4-Aminoazobenzene	60-09-3					
	Aniline	62-53-3					
	Benzidine	92-87-5					
	m-Toluidine	108-44-1					
	n,n-Diethylanaline	91-66-7					
	n-Ethylaniline	103-69-5					
	n-Methylaniline	100-61-8					
	o-Aminoazotoluene	97-56-3					
	o-Anisidine	90-04-0					
	o-Toluidine	95-53-4					
	p-Cresidine	120-71-8					
	p-Toluidine	106-49-0					
	C.I Acid RED 26	3761-53-3					
	C.I. Solvent Yellow 14	842-07-9					
	C.I. Disperse Yellow 3	2832-40-8					
	C.I Solvent Yellow 2	60-11-7					
	1,2-dihydro-6-hydroxy-4-methyl-1-[3-(1-methylethoxy)propyl]-2-oxo-5-[[4-(phenylazo) phenyl]azo]-3-pyridinecarbonitrile	85136-74-9					
	methylenebis(4,1-phenylenazo(1-(3-(dimethylamino)propyl)-1,2-dihydro-6-hydroxy-4-methyl-2-oxopyridine-5,3-diyl)))-1,1'-dipyridinium dichloride dihydrochloride 118658-99-4	118658-99-4	Detection limit pending	Detection limit pending			Banned
	Pigment Rot 53:1 (C.I. 15585:1); D&C Red No. 9	5160-02-1					
	C.I. Direct Blue 218	28407-37-6					
	Diaminobenzidine [biphenyl-3,3',4,4'-tetrayltetraamine]	91-95-2					
	Diaminotoluene	25376-45-8					
	N,N'-Diacetylbenzidine	613-35-4					
	toluene-2,4-diammonium sulphate	65321-67-7					
5. Organotin compounds	Monobutyltin	Multiple	0.01	0.01	With Reference To DIN EN17353 And Followed by Gas Chromatography-Mass Spectrometry (GC-MS) Analysis.	Solvent extraction, derivatisation with tetraethylborate, GC/MS.	Banned
	Dibutyltin	Multiple					
	Tributyltin	Multiple					
	Tetrabutyltin	1461-25-2					
	Monooctyltin	Multiple					
	Dioctyltin	Multiple					
	Triphenyltin	Multiple					
	Tricyclohexyltin	Multiple					
	Trioctyltin	Multiple					
	Tripropyltin	Multiple					
6. PFCs	PFOA	335-67-1	0.01	0.001	C EN/TS 15968:2010. LC/MS analysis.	Solvent extraction CEN/TS 15968:2010. LC/MS analysis.	Banned
	PFNA	375-95-1	0.01	0.001			
	PFBS	375-73-5 or 59933-66-3	0.01	0.001			
	PFOS	1763-23-1	0.01	0.001			
	4:2 FTOH	2043-47-2	0.1	0.1			
	6:2 FTOH	647-42-7	0.1	0.1			
	8:2 FTOH	678-39-7	0.1	0.1			
	10:2 FTOH	865-86-1	0.1	0.1			
	POSF	307-35-7	0.1	0.1			
	PFHxS	355-46-4	0.01	0.001			
	PFHxA	307-24-4	0.01	0.001			
	FOSA	754-91-6	0.1	0.01			
	N-Me-FOSA	31506-32-8	0.1	0.01			
	N-Et-FOSA	4151-50-2	0.1	0.01			
	N-Me-FOSE alcohol	24448-09-7	0.1	0.01			
	N-Et-FOSE alcohol	1691-99-2	0.1	0.01			
	PFBA	375-22-4	0.01	0.001			
	PFPeA	2706-90-3	0.01	0.001			
	PFHpA	375-85-9	0.01	0.001			
	PFDA	335-76-2	0.01	0.001			
	PFUnA	2058-94-8	0.01	0.001			
	PFDoA	307-55-1	0.01	0.001			
	PFTrA	72629-94-8	0.01	0.001			
	PFteA	376-06-7	0.01	0.001			
	PFHpS	375-92-8	0.01	0.001			
	PFDS	335-77-3	0.01	0.001			
	6:2 FTA	17527-29-6	0.1	0.1			
	8:2 FTA	27905-45-9	0.1	0.1			
	10:2 FTA	17741-60-5	0.1	0.1			
	PF-3,7-DMOA	172155-07-6	0.01	0.001			
	HPFHpA	1546-95-8	0.01	0.001			
	4HPFUnA	34598-33-9	0.01	0.001			
	1H, 1H, 2H, 2H-PFOS	27619-97-2	0.01	0.001			
7. Chloro benzenes	Chlorobenzene	108-90-7	0.02	0.1	Liquid extraction GC-MS analysis.	Solvent extraction GC-MS analysis.	Banned
	4-Chlorotoluene	106-43-4					
	1,2-Dichlorobenzene	95-50-1					
	1,3-Dichlorobenzene	541-73-1					
	1,4-Dichlorobenzene	106-46-7					
	1,2,4-Trichlorobenzene	120-82-1					
	1,2,3-Trichlorobenzene	87-61-6					
	1,3,5-Trichlorobenzene	108-70-3					
	1,2,3,4-Tetrachlorobenzene	634-66-2					
	1,2,3,5-Tetrachlorobenzene	634-90-2					
	1,2,4,5-Tetrachlorobenzene	95-94-3					

	Pentachlorobenzene	608-93-5					
	Hexachlorobenzene	118-74-1					
	Benzyl chloride; α-chlorotoluene	100-44-7	Detection limit pending	Detection limit pending			Banned
	p-chlorobenzotrichloride	5216-25-1					
	α,α,α-trichlorotoluene; benzotrichloride	98-07-7					
	α,α-Dichlorotoluene (Benzal chloride)	98-87-3					
8. Chlorinated solvents	Bromodichloromethane	75-27-4	1	0.3	By Headspace Gas Chromatography Mass Spectrometric (HS – GC/MS) Analysis.	GC-MS Headspace analysis.	Banned
	Bromoform	75-25-2					
	Carbon tetrachloride	56-23-5					
	Chlorodibromomethane	124-48-1					
	Chloroethane	75-00-3					
	Chloroform	67-66-3					
	Dibromomethane	74-95-3					
	1,1-Dichloroethane	75-34-3					
	1,2-Dichloroethane	107-06-2					
	1,1-Dichloroethene	75-35-4					
	cis-1,2-Dichloroethene	156-59-2					
	trans-1,2-Dichloroethene	156-60-5					
	trans-1,3-Dichloropropene	10061-02-6					
	Hexachlorobutadiene	87-68-3					
	Methylene chloride	75-09-2					
	1,1,2,2-Tetrachloroethane	79-34-5					
	Tetrachloroethene	127-18-4					
	1,1,1-Trichloroethane	71-55-6					
	Trichloroethene	79-01-6					
	Vinyl chloride	75-01-4					
	Hexachloroethane	67-72-1					
	1,1,1,2-Tetrachloroethane	630-20-6					
	1,1,2-Trichloroethane	79-00-5					
9. ChlOro phenols	4-Chloro-3-methylphenol	59-50-7	0.5	0.025	Liquid extraction, derivatisation, with acetic anhydride, GC-MS analysis.	Solvent extraction, derivatisation, with acetic anhydride, GC-MS analysis.	Banned
	2-Chlorophenol	95-57-8					
	2,4-Dichlorophenol	120-83-2					
	2,5-Dichlorophenol	583-78-8					
	2,6-Dichlorophenol	87-65-0					
	Pentachlorophenol (PCP)	87-86-5					
	2,3,4,6-Tetrachlorophenol	58-90-2					
	2,4,5-Trichlorophenol	95-95-4					
	2,4,6-Trichlorophenol	88-06-2					
	2,3,4,5-Tetrachlorophenol	4901-51-3					
	2,3,5,6-Tetrachlorophenol	935-95-5					
	Tetrachlorophenols (TeCP)	25167-83-3					
	2,3,4-Trichlorophenol	15950-66-0					
	2,3,5-Trichlorophenol	933-78-8					
	3,4,5-Trichlorophenol	609-19-8					
	3,5- Dichlorophenol	591-35-5					
	2,3-Dichlorophenol	576-24-9					
	3,4-Dichlorophenol	95-77-2					
	3-chlorophenol	108-43-0					
	4-chlorophenol	106-48-9					
	O-Phenylphenol	90-43-7					
10. SCCP	Short-Chain Chlorinated Paraffins (C10-C13)	85535-84-8	0.4	0.03	Liquid extraction with toluene, GC-MS resp. LC/MS analysis.	Solvent extraction with toluene, GC-MS resp. LC/MS analysis.	Banned
11. Heavy metals	Lead, Pb	7439-92-1	1	Detection limit pending	Digestion, ICP analysis.	Digestion, ICP analysis.	Phase-out*
	Cadmium, Cd	7440-43-9	0.1				Phase-out*
	Mercury, Hg	7439-97-6	0.05				Banned
	Antimony, Sb	7440-36-0	1				Phase-out*
	Arsenic, As	7440-38-2	1				Phase-out*
	Chromium, Cr (total)	7440-47-3	1				Phase-out*
	Cobalt, Co	7440-48-4	1				Phase-out*
	Copper, Cu	7440-50-8	1				Phase-out*
	Nickel, Ni	7440-02-0	1				Phase-out*
	Zinc, Zn	7440-66-6	1				Phase-out*
	Total Manganese	7439-96-5	1				Phase-out*
	Chromium, hexavalent, Cr(VI)	7440-47-3	1				Banned
	Cyanide (CN-)	Various	20				Phase-out*
	Beryllium & beryllium oxide	7440-41-7/ 1304-56-9	Detection limit pending				
	Vanadium pentoxide	1314-62-1					
12. Solvents	Formaldehyde	50-00-0	0.1	Detection limit pending			Banned
	Dimethyl formamide (DMF)	68-12-2					
	N, N dimethylacetamide	127-19-5					
	Formamide	75-12-7	Detection limit pending	Detection limit pending			
	N-methyl-2-pyrrolidone	872-50-4					

In green: new substances.

In red: new substances with detection limit pending.

Revised: May 2016

***Heavy Metals: To be phased out before 2018.**