

TEST REPORT

Facility: Shaoxing City Dushu Wool Textile Co., Ltd.

Country: China

Address: Dushu Village Donghu Town, Shaoxing City, Zhejiang Province, China

Date of report: 29 Jul, 2015

INTRODUCTION

Benetton Group has a relevant experience of environmentally responsible business practices and is putting significant resources and passion on its environmental program with the objective to minimize the impact of all its activities and preserve the natural resources for present and future generations.

Benetton Group Restricted Substances List (RSL) contains the complete list of banned or restricted chemical substances.

In line with the Company's commitment to zero discharges of hazardous substances by 2020, chemical investigations are regularly conducted by independent external auditors considering the following groups of hazardous chemical substances and using the lowest detection limits currently available with the best in class chemical laboratories around the world:

PRIORITY CHEMICAL GROUPS

1. Alkylphenols
2. Phthalates
3. Brominated and chlorinated flame retardants
4. Azo dyes
5. Organotin compounds
6. Perfluorinated chemicals
7. Chlorobenzenes
8. Chlorinated solvents
9. Chlorophenols
10. Short chain chlorinated paraffins
11. Heavy metals such as cadmium, lead, mercury and chromium (VI).

The findings are meant to highlight the current level of use (at times also unintentional) of the above chemical groups through a comparison of the incoming, UNTREATED wastewaters (i.e. samples are collected upstream of any wastewaters treatment plant) and treated wastewater (if there is. i.e. samples are collected downstream of self-owned Effluent Treatment Plant). The comparison is in fact a valuable tool to identify if and in which formulations, used by the facility, the above chemical groups might be contained, helping to subsequently identify potential alternatives of assessed lower impact.

For every specific situation an action plan is designed and a monitoring procedure is put in place to avoid non viable substitutions.

Facility details and analysis results

Date: 29 Jul, 2015

Facility Name: Shaoxing City Dushu Wool Textile Co., Ltd.

Address: Dushu Village Donghu Town, Shaoxing City, Zhejiang Province, China

Activity:

Sample Description:

Two (2) Samples:

(1) Transparent Liquid, Incoming Water, Tap Water, Collected During Operating Hours on Jul. 13, 2015;

(2) Black Liquid, Untreated Discharge Water, Collected During Operating Hours on Jul. 13, 2015.

The water samples were collected and tested by Intertek.

SUMMARY

Test Items

	(1)	Result	(2)
Azodyes (Banned Aromatic Amines)	<input type="checkbox"/>		■
Chlorinated Solvents	■		■
Phthalates	-		<input type="checkbox"/>
Brominated and Chlorinated Flame Retardants	-		<input type="checkbox"/>
Organic Tin Compounds	-		<input type="checkbox"/>
Chlorophenols	-		<input type="checkbox"/>
Short-Chain Chlorinated Paraffins (C ₁₀ -C ₁₃)	-		<input type="checkbox"/>
Heavy Metals	■		■
Alkylphenol	<input type="checkbox"/>		■
ethoxylates/Alkylphenols(APEOs/APs)			
Perfluorinated Chemicals (PFCs)	-		<input type="checkbox"/>
Chlorinated Benzenes	-		<input type="checkbox"/>
Cyanide	<input type="checkbox"/>		■

Note/ Key

- ■ — Detected
- □ — Not Detected
- - — Not Tested

To be continued

- Detection of Amines Derived from Azocolourants and Azodyes

With Reference to EN 14362:1&3, by Gas Chromatographic - Mass Spectrometric (GC-MS) and High Performance Liquid Chromatographic - Diode Array Detector(HPLC-DAD) Analysis.

<u>Compound(s)</u>	<u>Cas No.</u>	<u>Result (µg/L)</u>	
		(1)	(2)
1,4-Phenylenediamine	106-50-3	ND	ND
2,4,5-Trimethylaniline	137-17-7	ND	ND
2,4-Diaminoanisole	615-05-4	ND	ND
2,4-Diaminotoluene	95-80-7	ND	ND
2,4-Xylidine	95-68-1	ND	ND
2,6-Xylidine	87-62-7	ND	ND
2-Chloroaniline	95-51-2	ND	ND
2-Naphthylamine	91-59-8	ND	ND
3,3'-Dichlorobenzidine	91-94-1	ND	ND
3,3'-Dimethoxybenzidine	119-90-4	ND	ND
3,3'-Dimethyl-4,4'-diaminodiphenylmethane	838-88-0	ND	ND
3,3'-Dimethylbenzidine	119-93-7	ND	ND
4,4'-Diaminodiphenylmethane	101-77-9	ND	ND
4,4'-Methylene-bis(2-chloroaniline)	101-14-4	ND	ND
4,4'-Oxydianiline	101-80-4	ND	ND
4,4'-Thiodianiline	139-65-1	ND	ND
4-Aminobiphenyl	92-67-1	ND	ND
4-Chloroaniline	106-47-8	ND	ND
4-Chloro-o-toluidine	95-69-2	ND	ND
5-Nitro-o-anisidine	99-59-2	ND	ND
5-Nitro-o-toluidine	99-55-8	ND	ND
4-Aminoazobenzene	60-09-3	ND	ND
Aniline	62-53-3	ND	0.2
Benzidine	92-87-5	ND	ND
m-Toluidine	108-44-1	ND	ND
n,n-Diethylaniline	91-66-7	ND	ND
n-Ethylaniline	103-69-5	ND	ND
n-Methylaniline	100-61-8	ND	ND
o-Aminoazotoluene	97-56-3	ND	ND
o-Anisidine	90-04-0	ND	ND
o-Toluidine	95-53-4	ND	ND
p-Cresidine	120-71-8	ND	ND
p-Toluidine	106-49-0	ND	ND

Remark: ND= Not detected
Detection limit = 0.1µg/L

To be continued

- Chlorinated Solvents

By Headspace Gas Chromatography Mass Spectrometric (HS-GC/MS) Analysis.

<u>Compound(s)</u>	<u>Cas No.</u>	<u>Result (µg/L)</u>	
		(1)	(2)
Carbon tetrachloride	56-23-5	ND	ND
Pentachloroethane	76-01-7	ND	ND
1,1,1-trichloroethane	71-55-6	ND	ND
1,1,1,2-tetrachloroethane	630-20-6	ND	ND
1,1,2,2-tetrachloroethane	79-34-5	ND	ND
Chloroform	67-66-3	ND	ND
1,1,2-trichloroethane	79-00-5	ND	ND
1,1-dichloroethylene	75-35-4	ND	ND
Trichloroethylene	79-01-6	ND	ND
Tetrachloroethylene	127-18-4	ND	ND
1,2-dichloroethane	107-06-2	ND	ND
Dichloromethane	75-09-2	2	4

Remark: ND= Not detected
Detection limit = 1µg/L

To be continued

- Phthalates

Solvent Extraction and by Gas Chromatography-Mass Spectrometry (GC-MS) Analysis.

<u>Compound(s)</u>	<u>Cas No.</u>	<u>Result (µg/L)</u>	
		(1)	(2)
Di-iso-butyl-phthalate(DIBP)	84-69-5	--	ND
Di-butyl-phthalate(DBP)	84-74-2	--	ND
Benzyl-butyl-phthalate(BBP)	85-68-7	--	ND
Di-(2-ethyl-hexyl)-phthalate(DEHP)	117-81-7	--	ND
Di-n-octyl-phthalate(DNOP)	117-84-0	--	ND
Di-iso-nonyl-phthalate(DINP)	68515-48-0	--	ND
Di-iso-decyl-phthalate(DIDP)	26761-40-0	--	ND
Di-methyl-phthalate(DMP)	131-11-3	--	ND
Di-ethyl-phthalate(DEP)	84-66-2	--	ND
Di-n-propyl-phthalate(DPrP / DPP)	131-16-8	--	ND
Di-iso-pentyl-phthalate(DIPP)	210-088-4	--	ND
Di-n-hexyl-phthalate(DNHP)	84-75-3	--	ND
Di-cyclo-hexyl-phthalate(DCHP)	84-61-7	--	ND
Di-iso-heptyl-phthalate(DIHP)	71888-89-6	--	ND
Di-iso-octyl-phthalate(DIOP)	27554-26-3	--	ND
Di-nonyl-phthalate(DNP)	84-76-4	--	ND
Bis-(2-methoxy-ethyl)-phthalate(DMEP)	117-82-8	--	ND
1,2-Benzene-di-carboxylic acid di-pentyl- esters, branched and linear	84777-06-0	--	ND
N-iso-pentyl-iso-pentyl-phthalate(PIPP)	776297-69-9	--	ND
1,2-Benzene-di-carboxylic acid, di-C _{7,11} - branched and linear alkyl esters(DHNUP)	68515-42-4	--	ND

Remark: ND= Not detected

Detection limit = 1 µg/L

To be continued

- Brominated And Chlorinated Flame Retardants

Solvent Extraction and by Liquid Chromatography - Mass Spectrometry (LC-MS) and Gas Chromatography - Mass Spectrometry (GC-MS) Analysis.

<u>Compound(s)</u>	<u>Cas No.</u>	<u>Result (µg/L)</u>		<u>Detection Limit (µg/L)</u>
		(1)	(2)	
Polybrominated Biphenyles(PBBs)	various	--	ND	
Bromo-biphenyl	-	--	ND	0.05
Di-bromo-biphenyl	-	--	ND	0.05
Tri-bromo-biphenyl	-	--	ND	0.05
Tetra-bromo-biphenyl	-	--	ND	0.05
Penta-bromo-biphenyl	-	--	ND	0.05
Hexa-bromo-biphenyl	-	--	ND	0.05
Hepta-bromo-biphenyl	-	--	ND	0.05
Octa-bromo-biphenyl	-	--	ND	0.05
Nona-bromo-biphenyl	-	--	ND	0.05
Deca-bromo-biphenyl	13654-09-6	--	ND	0.05
Polybrominated Diphenyl ethers(PBDEs)	various	--	ND	
Bromo-diphenyl-ether	-	--	ND	0.05
Di-bromo-diphenyl-ether	-	--	ND	0.05
Tri-bromo-diphenyl-ether	-	--	ND	0.05
Tetra-bromo-diphenyl-ether	-	--	ND	0.05
Penta-bromo-diphenyl-ether	-	--	ND	0.05
Hexa-bromo-diphenyl-ether	-	--	ND	0.05
Hepta-bromo-diphenyl-ether	-	--	ND	0.05
Octa-bromo-diphenyl-ether	-	--	ND	0.05
Nona-bromo-diphenyl-ether	-	--	ND	0.05
Deca-bromo-diphenyl-ether	1163-19-5	--	ND	0.05
Hexa-bromo-cyclo-dodecan(HBCDD)	3194-55-6	--	ND	0.5
Tri-(2,3-di-bromo-propyl)-phosphate(TRIS)	126-72-7	--	ND	0.5
Tetra-bromo-bisphenol-A(TBBPA)	79-94-7	--	ND	0.5
Tetra-bromo-bisphenol A bis-(d-ibromo-propyl-ether)(TBBPA-BDPE)	21850-44-2	--	ND	0.5
Bis-(2,3-di-bromo-propyl)-phosphate	5412-25-9	--	ND	0.5
Tris-(2-chloro-ethyl)-phosphate(TCEP)	115-96-8	--	ND	0.05
Tris-(1,3-di-chloro-iso-propyl)-phosphate(TDCPP)	13674-87-8	--	ND	0.05
Tris-(2-chloroisopropyl)-phosphate(TCPP)	13674-84-5	--	ND	0.5

Remark: ND= Not detected

To be continued

- Organic Tin Compounds

With Reference to DIN EN 17353, by Gas Chromatography-Mass Spectrometry (GC-MS) Analysis.

<u>Compound(s)</u>	<u>Result (µg/L)</u>	
	(1)	(2)
Monobutyltin (MBT)	--	ND
Dibutyltin (DBT)	--	ND
Tributyltin (TBT)	--	ND
Triphenyltin (TPhT)	--	ND
Diocetyl tin (DOT)	--	ND
Monooctyltin (MOT)	--	ND
Tetrabutyltin (TeBT)	--	ND
Triocetyl tin (TriOT)	--	ND
Tricyclohexyltin (TCyHT)	--	ND
Tripropyltin (TPT)	--	ND

Remark: ND= Not Detected
Detection limit =0.01µg/L

- Chlorophenols

Solvent Extraction and Acetylated by Acetic Anhydride, and Analyzed by Gas Chromatography-Mass Spectrometry (GC-MS).

<u>Compound(s)</u>	<u>Cas No.</u>	<u>Result (µg/L)</u>	
		(1)	(2)
Pentachlorophenol (PCP)	87-86-5	--	ND
Tetrachlorophenols (TeCP)	25167-83-3	--	ND
Trichlorophenols (TriCP)	Various	--	ND
Dichlorophenol (DiCP)	Various	--	ND
Monochlorophenol	Various	--	ND

Remark: ND = Not detected
Detection limit = 0.5µg/L

- Short-Chain Chlorinated Paraffins (C₁₀-C₁₃)

Solvent Extraction and by Liquid Chromatography - Mass Spectrometry (LC-MS) Analysis.

<u>Compound(s)</u>	<u>Cas No.</u>	<u>Result (µg/L)</u>	
		(1)	(2)
Short-chain chlorinated paraffins (C ₁₀ -C ₁₃)	85535-84-8	--	ND

Remark: ND = Not detected
Detection limit = 0.4µg/L

To be continued

- Heavy Metals

By Inductively Coupled Argon Plasma-Mass Spectrometry(ICP-MS) Analysis and by Ion Chromatography- Inductively Coupled Argon Plasma-Mass Spectrometry(IC-ICP-MS) Analysis .

<u>Compound(s)</u>	<u>CAS No.</u>	<u>Result (µg/L)</u>		<u>Detection Limit (µg/L)</u>
		(1)	(2)	
Total Cadmium(Cd)	7440-43-9	ND	0.2	0.1
Total Lead(Pb)	7439-92-1	ND	4	1
Total Mercury(Hg)	7439-97-6	ND	ND	0.5
Total Hexavalent Chromium(Cr-VI)	18540-29-9	ND	ND	1
Total Arsenic (As)	7440-38-2	ND	6	1
Total Antimony (Sb)	7440-36-0	ND	12	1
Total Cobalt (Co)	7440-48-4	ND	2	1
Total Nickel (Ni)	7440-02-0	ND	5	1
Total Copper (Cu)	7440-50-8	2	77	1
Total Zinc (Zn)	7440-66-6	51	2183	1
Total Manganese (Mn)	7439-95-4	11	180	1
Total Chromium (Cr)	7440-47-3	ND	8	1

Remark: ND = Not detected

- Alkylphenol ethoxylates/Alkylphenols(APEOs/APs)

Solvent Extraction and by Gas Chromatography-Mass Spectrometry (GC-MS) and by Liquid Chromatography-Mass Spectrometry (LC-MS/MS) Analysis.

<u>Compound(s)</u>	<u>Cas No.</u>	<u>Result (µg/L)</u>		<u>Detection Limit (µg/L)</u>
		(1)	(2)	
Nonylphenols	54852-15-3			
	104-40-5	ND	ND	1
	1173019-62-9			
Octylphenols	1806-26-4	ND	ND	1
	140-66-9			
Nonylphenoethoxylates 3-18	-	ND	13.3	2.5
Octylphenoethoxylates 3-18	-	ND	ND	2.5
Nonylphenoethoxylates 1+2	-	ND	ND	5
Octylphenoethoxylates 1+2	-	ND	ND	5

Remark: ND = Not detected

To be continued

- Perfluorinated Chemicals (PFCs)

By Liquid Chromatography – Mass Spectrometry (LC-MS/MS) Analysis.

<u>Compound(s)</u>	<u>Cas No.</u>	<u>Result (µg/L)</u>	
		(1)	(2)
Perfluorooctane sulphonates (PFOS)	2795-39-3	--	ND
Perfluoro-octane-sulfon- amide(PFOSA)	754-91-6	--	ND
N-Methyl-Perfluoro-octane-sulfon-amide(N-Me-FOSA)	31506-32-8	--	ND
N-Ethyl-Perfluoro-octane-sulfon-amide(N-Et-FOSA)	4151-50-2	--	ND
N-Methyl-Perfluoro-octane-sulfon-amido-ethanol(N-Me-FOSE alcohol)	24448-09-7	--	ND
N-Ethyl-Perfluoro-octane-sulfon-amido-ethanol(N-Et-FOSE alcohol)	1691-99-2	--	ND
Perfluoro-octane acid	335-67-1	--	ND
Perfluoro-butanoic acid	375-22-4	--	ND
Perfluoro-pentanoic acid	2706-90-3	--	ND
Perfluoro-hexanoic acid	307-24-4	--	ND
Perfluoro-heptanoic acid	375-85-9	--	ND
Perfluoro-nonanoic acid	375-95-1	--	ND
Perfluoro-decanoic acid	335-76-2	--	ND
Perfluoro-undecanoic acid	2058-94-8	--	ND
Perfluoro-dodecanoic acid	307-55-1	--	ND
Perfluoro-tridecanoic acid	72629-94-8	--	ND
Perfluoro-tetradecanoic acid	376-06-7	--	ND
Perfluoro-butane-sulfonic acid	375-73-5	--	ND
Perfluoro-hexane-sulfonic acid	355-46-4 / 432-50-7	--	ND
Perfluoro-heptane-sulfonic acid	375-92-8	--	ND
Perfluor-decane-sulfonic acid	355-77-3	--	ND
1H,1H,2H,2H-Perfluoro-octane-sulphonic acid	27619-97-2	--	ND
2H,2H,3H,3H-Perfluoro-undecanoic acid	34598-33-9	--	ND
Perfluoro-3-7-dimethyl octane carboxylate	172155-07-6	--	ND
7H-Dodecafluoro heptane carboxylate	1546-95-8	--	ND

Remark: ND = Not detected
Detection limit = 0.2µg/L

To be continued

- Chlorinated Benzenes

Solvent Extraction and Followed by Gas Chromatography-Mass Spectrometry (GC-MS) Analysis.

<u>Compound(s)</u>	<u>Cas No.</u>	<u>Result(µg/L)</u>	
		(1)	(2)
Dichlorobenzene	various	--	ND
Trichlorobenzenes	various	--	ND
Tetrachlorobenzenes	various	--	ND
Pentachlorobenzenes	608-93-5	--	ND
Hexachlorobenenes	118-74-1	--	ND
Chlorobenzene	108-90-7	--	ND

Remark: ND = Not detected
Detection limit = 0.02µg/L

- Cyanide

With Reference to HJ 484 by Spectrophotometer Analysis.

<u>Compound(s)</u>	<u>Result(ug/L)</u>	
	(1)	(2)
Cyanide	ND	7

Remarks: Detection limit = 4 ug/L
ND = Not detected

Testing Period: Jul. 14, 2015 To Jul. 28, 2015

End of report