

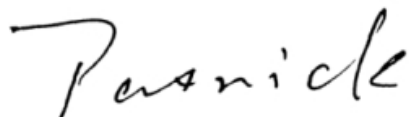
Applicant : Shandong Denosen Environmental Protection Material Technology Co., Ltd
Ciyao Chemical Park, Ningyang County, Tai 'an City, Shandong Province
Date : Mar 18, 2024
Attn : Fei Xianduo

Sample Description :

One (1) Bag Of Submitted Sample Said To Be Disperse Fluorescent Red 277 In Red.

Date Received	: Mar 08, 2024
Date Test Started	: Mar 08, 2024
Nature of the Sample Received	: Powder
Application of End Use	: 1.7 Dyes and pigments
Chemical Formulation Type	: 1.7 Dyes and pigments 1.7.12 Disperse Dye
Item Name	: Disperse Fluorescent Red 277
Alternative Name	: -
Functional Use	: Fabric Dye
Ingredient	: -
MSDS or SDS Provided	: Yes
Supplemental Chemical Formulation	: Yes
Information Form Provided	: -
Character	: Flammability: Inflammable Solubility: Water Soluble Ionicity: Nonionic Others:-
Batch/Lot No.	: -
Color	: Red
End Product Buyer Name	: -
Manufacturer's Name	: Shandong Denosen Environmental Protection Material Technology Co., Ltd
Agent Name	: -
End Use	: Textile Processing
Sample Submitted Status	: Sealed in Plastic Bag

Authorized By :
For Intertek Testing Services
(Tianjin) Ltd.



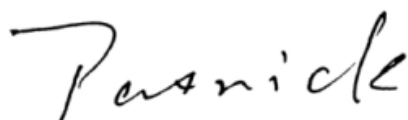
Patrick Gong
General Manager

Conclusion:

<u>Tested Sample</u>	<u>Standard</u>	<u>Result</u>
	As Per ZDHC Manufacturing Restricted Substances List Version 3.1	
	Chapter 1: MRSL for Textiles Processing	
Submitted Sample	- Alkylphenol (AP) and Alkylphenol Ethoxylates (APEOs): including all isomers	Pass
	- Chlorobenzenes and Chlorotoluenes	Pass
	- Chlorophenols	Pass
	- Dyes – Azo (Forming Restricted Amines)	Pass
	- Dyes – Carcinogenic or Equivalent Concern	Pass
	- Dyes – Disperse (Sensitizing)	Pass
	- (Free) Aniline	Pass
	- Organic Solvents Content	Pass
	- Polycyclic Aromatic Hydrocarbons (PAHs)	Pass
	- Total Heavy Metals	Pass
	- Quinoline	Pass

Expiry Date:	Mar 17, 2026
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Authorized By :
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Patrick Gong
General Manager

Tests Conducted:

- 1 Alkylphenol (AP) and Alkylphenol Ethoxylates (APEOs): including all isomers:

With Reference To ISO 18254-1:2016 and ISO 21084:2019, By Dissolution in Organic Solvent And Followed By Liquid Chromatographic - Mass Spectrometric (LC-MS) Analysis.

<u>Compound</u>	<u>CAS No.</u>	<u>Result In ppm</u>	<u>Formulation Limit In ppm</u>
Nonylphenol (NP), mixed isomers	104-40-5 11066-49-2 25154-52-3 84852-15-3	ND	Sum: 100
Octylphenol (OP), mixed isomers	140-66-9 1806-26-4 27193-28-8	ND	Sum: 100
Octylphenol ethoxylates (OPEO)	9002-93-1 9036-19-5 68987-90-6	ND	Sum: 250
Nonylphenol ethoxylates (NPEO)	9016-45-9 26027-38-3 37205-87-1 68412-54-4 127087-87-0	ND	Sum: 250

Remark : ppm = parts per million = mg/kg

ND = Less than Reporting Limit

Reporting Limit = 100 ppm for NP and OP; 250 ppm for NPEO and OPEO

Tests Conducted :

2 Chlorobenzenes and Chlorotoluenes:

With reference to EN 17137: 2018, By Dissolution in Organic Solvent And Followed By Gas Chromatography- Mass Spectrometry (GC-MS) Analysis.

<u>Compound</u>	<u>CAS No.</u>	<u>Result In ppm</u>	<u>Formulation Limit In ppm</u>
Monochlorobenzene	108-90-7	ND	
Dichlorobenzenes	Various	ND	
Trichlorobenzenes	Various	ND	
Tetrachlorobenzenes	Various	ND	
Pentachlorobenzene	608-93-5	ND	
Hexachlorobenzene	118-74-1	ND	
Monochlorotoluenes	Various	ND	
Dichlorotoluenes	Various	ND	
Trichlorotoluenes	Various	ND	10
Tetrachlorotoluenes	Various	ND	10
Pentachlorotoluene	877-11-2	ND	
Sum Of Above Compounds	--	ND	200
1,2-dichlorobenzene	95-50-1	ND	500

Remark : ppm = parts per million = mg/kg

ND = Less than Reporting Limit

Reporting Limit = 500 ppm For 1,2-dichlorobenzene;

10 ppm for Trichlorotoluenes/ Tetrachlorotoluenes;

200 ppm (Sum) For Other Compounds

Tests Conducted :

3 Chlorophenols:

With Reference to DIN 50009:2021, By Dissolution in KOH. Derivatization with Acetic Anhydride and Followed By Gas Chromatography- Mass Spectrometry (GC-MS) Analysis.

Compound	CAS No.	Result In ppm	Formulation Limit In ppm
2-chlorophenol	95-57-8	ND	--
3-chlorophenol	108-43-0	ND	--
4-chlorophenol	106-48-9	ND	--
2,3-dichlorophenol	576-24-9	ND	--
2,4-dichlorophenol	120-83-2	ND	--
2,5-dichlorophenol	583-78-8	ND	--
2,6-dichlorophenol	87-65-0	ND	--
3,4-dichlorophenol	95-77-2	ND	--
3,5-dichlorophenol	591-35-5	ND	--
2,4,5-trichlorophenol	95-95-4	ND	--
2,4,6-trichlorophenol	88-06-2	ND	--
2,3,4-trichlorophenol	15950-66-0	ND	--
2,3,5-trichlorophenol	933-78-8	ND	--
3,4,5-trichlorophenol	609-19-8	ND	--
2,3,6-trichlorophenol	933-75-5	ND	--
Sum Of Above Compounds	--	ND	50
2,3,4,5-Tetrachlorophenol	4901-51-3	ND	--
2,3,4,6-Tetrachlorophenol	58-90-2	ND	--
2,3,5,6-Tetrachlorophenol	935-95-5	ND	--
Sum Of Above Compounds	--	ND	15
Pentachlorophenol (PCP)	87-86-5	ND	5

Remark : ppm = parts per million = mg/kg

ND = Less than Reporting Limit

Reporting Limit = 50 ppm for sum of Chlorophenols except Tetrachlorophenol & Pentachlorophenol
15 ppm for sum of Tetrachlorophenol and 5 ppm for Pentachlorophenol

Tests Conducted :

4 Dyes – Disperse (Sensitising):

With reference to DIN 54231: 2022, By Dissolution in Organic Solvent Extraction And Followed By Liquid Chromatographic – Tandem Mass Spectrometric (LC/MS/MS) Analysis.

<u>Compound</u>	<u>CAS No.</u>	<u>Result In ppm</u>	<u>Formulation Limit In ppm</u>
Disperse Yellow 1	119-15-3	ND	250
Disperse Blue 102	12222-97-8	ND	250
Disperse Blue 106	12223-01-7	ND	250
Disperse Yellow 39	12236-29-2	ND	250
Disperse Orange 37/59/76	13301-61-6	ND	250
Disperse Brown 1	23355-64-8	ND	250
Disperse Orange 1	2581-69-3	ND	250
Disperse Yellow 3	2832-40-8	ND	250
Disperse Red 11	2872-48-2	ND	250
Disperse Red 1	2872-52-8	ND	250
Disperse Red 17	3179-89-3	ND	250
Disperse Blue 7	3179-90-6	ND	250
Disperse Blue 26	3860-63-7	ND	250
Disperse Yellow 49	54824-37-2	ND	250
Disperse Blue 35	12222-75-2 56524-77-7	ND	250
Disperse Blue 124	61951-51-7	ND	250
Disperse Yellow 9	6373-73-5	ND	250
Disperse Orange 3	730-40-5	ND	250

Remark : ppm = parts per million = mg/kg
ND = Less than Reporting Limit
Reporting Limit = 100 ppm

Tests Conducted :

5 Dyes - Carcinogenic or Equivalent Concern:

With reference to DIN 54231:2022, By Dissolution in Organic Solvent And Followed By Liquid Chromatographic – Tandem Mass Spectrometric (LC/MS/MS) Analysis.

<u>Compound</u>	<u>CAS No.</u>	<u>Result In ppm</u>	<u>Formulation Limit In ppm</u>
C.I. Direct Black 38	1937-37-7	ND	250
C.I. Direct Blue 6	2602-46-2	ND	250
C.I. Acid Red 26	3761-53-3	ND	250
C.I. Basic Red 9	569-61-9	ND	250
C.I. Direct Red 28	573-58-0	ND	250
C.I. Basic Violet 14	632-99-5	ND	250
C.I. Disperse Blue 1	2475-45-8	ND	250
C.I. Disperse Blue 3	2475-46-9	ND	250
C.I. Basic Blue 26 (with Michler's Ketone > 0.1%)	2580-56-5	ND	250
C.I. Basic Green 4 (malachite green chloride, malachite green oxalate, malachite green)	569-64-2 2437-29-8 10309-95-2	ND	250
C.I. Basic Green 4 leuco base	129-73-7	ND	250
C.I. Disperse Orange 11	82-28-0	ND	250
C.I. Acid Violet 49	1694-09-3	ND	250
C.I. Basic violet 3 with >0.1% of Michler's Ketone	548-62-9	ND	250

Remark : ppm = parts per million = mg/kg
ND = Less than Reporting Limit
Reporting Limit = 100 ppm

Tests Conducted :

6 Detection Of Amines Derived From Azocolourants and Azodyes:

By Gas Chromatographic - Mass Spectrometric (GC-MS) Analysis.

Test Method : EN ISO 14362-1 : 2017 Annex F

	<u>Forbidden</u>	<u>Cas No.</u>	<u>Result</u>
			Method T
1.	4-Aminodiphenyl	92-67-1	N
2.	Benzidine	92-87-5	N
3.	4-Chloro-o-Toluidine	95-69-2	N
4.	2-Naphthylamine	91-59-8	N
5.	o-Aminoazotoluene	97-56-3	N
6.	2-Amino-4-Nitrotoluene	99-55-8	N
7.	p-Chloroaniline	106-47-8	N
8.	2,4-Diaminoaniso	615-05-4	N
9.	4,4'-Diaminodiphenylmethane	101-77-9	N
10.	3,3'-Dichlorobenzidine	91-94-1	N
11.	3,3'-Dimethoxybenzidine	119-90-4	N
12.	3,3'-Dimethylbenzidine	119-93-7	N
13.	3,3'-Dimethyl-4,4'diaminodiphenylmethane	838-88-0	N
14.	p-Cresidine	120-71-8	N
15.	4,4'-Methylene-Bis(2-Chloroaniline)	101-14-4	N
16.	z	101-80-4	N
17.	4,4'-Thiodianiline	139-65-1	N
18.	o-Toluidine	95-53-4	N
19.	2,4-Toluylenediamine	95-80-7	N
20.	2,4,5-Trimethylaniline	137-17-7	N
21.	o-Anisidine	90-04-0	N
22.	p-Aminoazobenzene	60-09-3	N
23.	2,6-xylidine	87-62-7	N
24.	2,4-xylidine	95-68-1	N
25.	2-Naphthylammoniumacetate^	553-00-4	N
26.	4-chloro-otoluidinium chloride^	3165-93-3	N
27.	4-methoxy-mphenylene diammonium sulphate; 2,4-diaminoaniso	39156-41-7	N
28.	2,4,5-trimethylaniline hydrochloride^	21436-97-5	N

Tests Conducted :

Detection Of Amines Derived From Azocolourants and Azodyes(Cont'd)

Remark : N = Less than Reporting Limit

Reporting limit = 150 ppm

ppm = parts per million = mg/kg

Limit : 150 ppm Max. Quoted from ZDHC Manufacturing Restricted Substances List Version 2.0: Chemical Supplier Commercial Formulation Limit

^ = The Determination Was Based On The Arylamine Analysis And Result Was Calculated Based On Worst Scenario.

Method T : Direct buffer extraction as per EN ISO 14362-1 : 2017 Section 10.2

7 (Free) Aniline:

With Reference to EN ISO 14362-1 : 2017 without reductive step, By Gas Chromatographic-Mass Spectrometric (GC-MS) Analysis.

<u>Compound</u>	<u>CAS No.</u>	<u>Result In ppm</u>	<u>Formulation Limit In ppm</u>
		Method T	
(Free) Aniline	62-53-3	ND	500

Remark : ppm = parts per million = mg/kg

ND = Less than Reporting Limit

Reporting Limit = 50 ppm

Method T : Direct buffer extraction as per EN ISO 14362-1 : 2017 Section 10.2

Tests Conducted :

8 Organic Solvents Content:

With Reference TO ISO 16189:2021, By Dissolution in Organic Solvent And Followed By Gas Chromatography-Mass Spectrometry (GC-MS) Analysis.

<u>Compound</u>	<u>CAS No.</u>	<u>Result In ppm</u>	<u>Formulation Limit In ppm</u>
Benzene	71-43-2	ND	50
Xylene	1330-20-7	ND	500
o-Xylene	95-47-6		
m-Xylene	108-38-3		
p-Xylene	106-42-3		
Cresol (all isomers)	1319-77-3	ND	500
o-Cresol	95-48-7		
m-Cresol	108-39-4		
p-Cresol	106-44-5		
N,N-Dimethylacetamide (DMAC)	127-19-5	ND	1000
N,N-Dimethylformamide (DMFa)	68-12-2	ND	1000
N-Ethyl-2 pyrrolidone (NEP)	2687-91-4	ND	1000
N-Methyl-2-Pyrrolidone (NMP)	872-50-4	ND	1000
Toluene	108-88-3	ND	500

Remark : ppm = parts per million = mg/kg

ND = Less than Reporting Limit

Reporting Limit = 20 ppm for Benzene and 200 ppm for others

Tests Conducted :

9 Polycyclic Aromatic Hydrocarbons (PAHs):

With Reference to AfPS GS 2019:01 PAK, By Solvent Extraction And Followed By Gas Chromatography- Mass Spectrometry (GC-MS) Analysis.

No.	Compound	CAS No.	Result In ppm	Formulation Limit In ppm
1	Benzo[a]pyrene (BaP)	50-32-8	ND	20
2	Anthracene	120-12-7	ND	--
3	Pyrene	129-00-0	ND	--
4	Benzo[ghi]perylene	191-24-2	ND	--
5	Benzo[e]pyrene	192-97-2	ND	--
6	Indeno[1,2,3-cd] pyrene	193-39-5	ND	--
7	Benzo[j]fluoranthene	205-82-3	ND	--
8	Benzo[b]fluoranthene	205-99-2	ND	--
9	Fluoranthene	206-44-0	ND	--
10	Benzo[k]fluoranthene	207-08-9	ND	--
11	Acenaphthylene	208-96-8	ND	--
12	Chrysene	218-01-9	ND	--
13	Dibenzo[a,h]anthracene	53-70-3	ND	--
14	Benzo[a]anthracene	56-55-3	ND	--
15	Acenaphthene	83-32-9	ND	--
16	Phenanthrene	85-01-8	ND	--
17	Fluorene	86-73-7	ND	--
18	Naphthalene	91-20-3	ND	--
	Sum Of No. 2~18 PAHs	--	ND	200

Remark : ppm = parts per million = mg/kg

ND = Less than Reporting Limit

Reporting Limit = 10 ppm for Benzo[a]pyrene

100 ppm for sum of other PAHs

Tests Conducted :

10 Total Heavy Metal Contents:

With reference to DIN EN 16711-1:2016, By Microwave Acid Digestion And Followed By Inductively Coupled Argon Plasma and Mass Spectrometry (ICP-MS) Analysis.

For Chromium VI (Cr VI) Confirmation and Quantitation, With Reference To ISO 17075-1 :2017 or ISO 17075-2:2017, Followed By UV-Visible Spectrophotometer (UV-Vis) or Ion-exchange Chromatograph with UV Detector (IC-UV) Analysis.

Elements	CAS No.	Result In ppm	Reporting Formulation Limit In ppm (ppm)	Formulation Limit In ppm
Tot. Arsenic (As)	7440-38-2	ND	25	50
Tot. Cadmium (Cd)	7440-43-9	ND	10	20
Tot. Mercury (Hg)	7439-97-6	ND	2	4
Tot. Lead (Pb)	7439-92-1	ND	50	100
Chromium VI (Cr VI)	18540-29-9	ND	10	10
Tot. Antimony (Sb)	7440-36-0	ND	25	50
Tot. Chromium (Cr)	7440-47-3	ND	50	100
Tot. Copper (Cu)	7440-50-8	ND	100	250
Tot. Nickel (Ni)	7440-02-0	ND	100	250
Tot. Tin (Sn)	7440-31-5	ND	100	250
Tot. Barium (Ba)	7440-39-3	ND	50	100
Tot. Cobalt (Co)	7440-48-4	ND	250	500
Tot. Selenium (Se)	7782-49-2	ND	10	20
Tot. Silver (Ag)	7440-22-4	ND	50	100

Remark : ppm = parts per million = mg/kg

ND = Less than Reporting Limit

= test result of chromium VI was based on total chromium content

Tests Conducted :

11 Quinoline:

With reference to DIN 54231: 2022, By Dissolution in Organic Solvent And Followed By Liquid Chromatographic – Tandem Mass Spectrometric (LC/MS/MS) Analysis.

<u>Compound</u>	<u>CAS No.</u>	<u>Result In ppm</u>	<u>Formulation Limit In ppm</u>
Quinoline	91-22-5	ND	1000

Remark : ppm = parts per million = mg/kg
ND = Less than Reporting Limit
Reporting Limit = 500 ppm

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