

A **dye**, natural or synthetic substance used to give colour to textiles, paper, leather and other materials in a way that the colouring is not altered by washing heat, light, or other factors to which the material is likely to be exposed. The dye is generally applied in an aqueous solution, and requires a mordant to improve the fastness of the dye on the fiber. Most dyes are organic compounds (i.e., they contain carbon). There are **natural dyes** and **synthetic dyes**.

Natural Dyes

Dyes can be obtained from natural sources generally from vegetables, such as plants, trees, and lichens, with a few from insects. Natural dyes are generally Ecologically Sustainable. Some natural dyes and their sources are

Colour/class	Name	Source
Yellow/Flavonoid	weld	seeds, stems, leaves of <i>Reseda luteola</i>
	Quercetin	North American oak bark, <i>Quercus tinctoria nigra</i>
	safflower	dried petals of <i>Carthamus tinctorius</i>
Red/Anthraquinone	kermes	Insects, <i>Coccus ilicis</i>
	cochineal	Insects, <i>Coccus ilicis</i>
	alizarin	madder plant roots, <i>Rubia tinctorum</i>
Blue/indigoid	indigo, woad	indigo plant leaves, <i>Indigofera tinctoria L.</i>
Purple/indigoid	Tyrian purple	mollusks, <i>Murex brandaris</i>
black/chroman	logwood	heartwood, <i>Haematoxylon campechianum L.</i>

Source: <http://www.britannica.com/EBchecked/topic/174980/dye>

Synthetic Dyes

Synthetic dyes are usually petro-chemical in origin. The first commercially successful synthetic dye, mauve, was serendipitously discovered by British chemist William H. Perkin in 1856. Many thousands of synthetic dyes have since been prepared. According to the chemical structure of the particular chromophoric group these dyes can be named. Such as diphenylmethane derivatives, triphenylmethane compounds, oxazine compounds, xanthene compounds, and Azo dyes are one of the most popular varieties of synthetic dyes. Today it is being used up to 90% in the dyeing units. Synthetic dyes are not only use in textile industries but these dyes serve many industries like medicine, chemistry, plastics, paint, printing ink, rubber, cosmetics, food etc. Use of the potentially dangerous chemicals in clothing and other items are toxic - possibly toxic enough to cause cancer. Some dyes have been banned from use. Please find here list of some banned dyes.

List of dyes banned by Government of India

The Ministry of Environment and Forests has prohibited the handling of 112 dyes which are capable of releasing any of the harmful amines.

List of 42 benzidine based dyes prohibited from 1993

The Ministry of Environment and Forests, Government of India has prohibited the handling of benzidine based dyes vide the notification published in the Gazette in January, 1990. As per this notification handling of all the 42 benzidine based dyes are prohibited from 1993 onwards. These are related to ban amines.

Sr.No.	Colour Index Generic Name	Colour Index Constitution No.
1.	Acid Orange 45	22195
2.	Acid Red 85	22245
3.	Acid Black 29	-
4.	Acid Black 94	30336
5.	Azoic Diazo Compo.112	37225
6.	Direct Yellow 1	22250
7.	Direct Yellow 24	22010
8.	Direct Orange 1	22370
9.	Direct Orange 8	22130
10.	Direct Red 1	22310
11.	Direct Red 10	22145
12.	Direct Red 13	22153
13.	Direct Red 17	22150
14.	Direct Red 28	22120
15.	Direct Red 37	22240
16.	Direct Red 44	22500
17.	Direct Violet 1	22570
18.	Direct Violet 12	22550
19.	Direct Violet 22	22480
20.	Direct Blue 2	22590
21.	Direct Blue 6	22610
22.	Direct Green 1	30280
23.	Direct Green 6	30295
24.	Direct Green 8	30315
25.	Direct Green 8:1	--
26.	Direct Brown 1	30045
27.	Direct Brown 1:2	30110
28.	Direct Brown 2	22311
29.	Direct Brown 6	30140
30.	Direct Brown 25	36030
31.	Direct Brown 27	31725
32.	Direct Brown 31	35660
33.	Direct Brown 33	35520
34.	Direct Brown 51	31710
35.	Direct Brown 59	22345
36.	Direct Brown 79	30056
37.	Direct Brown 95	30145
38.	Direct Brown 101	31740
39.	Direct Brown 154	30120
40.	Direct Black 4	30245
41.	Direct Black 29	22580
42.	Direct Black 38	30235

The Ministry of Environment and Forests has further prohibited the handling of 70 more Azo dyes which came under the banned category as per the notification published in the Gazette on 26th March, 1997.

List of 70 Azo Dyes Prohibited from June 1997

Sr.No.	Colour Index Generic Name	Colour Index Constitution No.
1	Acid Red 4	14710
2	Acid Red 5	14905
3	Acid Red 24	16140
4	Acid Red 26	16150
5	Acid Red 73	27290
6	Acid Red 114	23635
7	Acid Red 115	27200
8	Acid Red 116	26660
9	Acid Red 128	24125
10	Acid Red 148	26665
11	Acid Red 150	27190
12	Acid Red 158	20530
13	Acid Red 167	--
14	Acid Red 264	18133
15	Acid Red 265	18129
16	Acid Red 420	--
17	Acid Violet 12	18075
18	Acid Brown 415	--
19	Acid Black 131	--
20	Acid Black 132	--
21	Acid Black 209	--
22	Basic Red 111	--
23	Basic Red 42	--
24	Basic Brown 4	21010
25	Developer 14 = Oxidation Base 20	76035
26	Direct Yellow 48	23660
27	Direct Orange 6	23375
28	Direct Orange 7	23380
29	Direct Orange 10	23370
30	Direct Orange 108	29173
31	Direct Red 2	23500
32	Direct Red 7	24100
33	Direct Red 21	23560
34	Direct Red 22	23565
35	Direct Red 24	29185
36	Direct Red 26	29190
37	Direct Red 39	23630
38	Direct Red 46	23050
39	Direct Red 62	29175
40	Direct Red 67	23505
41	Direct Red 72	29200
42	Direct Violet 21	23520

43	Direct Blue 1	24410
44	Direct Blue 3	23705
45	Direct Blue 8	24140
46	Direct Blue 9	24155
47	Direct Blue 10	24340
48	Direct Blue 14	23850
49	Direct Blue 15	24400
50	Direct Blue 22	24280
51	Direct Blue 25	23790
52	Direct Blue 35	24145
53	Direct Blue 53	23860
54	Direct Blue 76	24411
55	Direct Blue 151	24175
56	Direct Blue 160	--
57	Direct Blue 173	--
58	Direct Blue 192	--
59	Direct Blue 201	--
60	Direct Blue 215	24115
61	Direct Blue 295	23820
62	Direct Green 85	30387
63	Direct Blue 222	30368
64	Direct Black 91	30400
65	Direct Black 154	--
66	Disperse Yellow 7	26090
67	Disperse Yellow 23	26070
68	Disperse Yellow 56	--
69	Disperse Orange 149	--
70	Disperse Red 151	26130

Source: <http://textilescommittee.nic.in/faq-lab.htm>

List of banned Amines

Amines are banned because the chemicals are released from some of the azo dyes on reductive cleavage. These are suspected to be carcinogenic and are being banned Germany and Netherlands have banned the presence of these amines and this is applicable to clothing, bed linen and footwear. The European Commission has circulated a working document relating to the restrictions on the marketing and use of dangerous substances and preparation (azo dyes), for the consideration of the European parliament and the Council. There are 22 banned amines substances according to Commission of the European Communities: Directive 2002/61/EC.

List of banned amines

Sr.No.	Name of amines
1	4-Amino biphenyl (CAS-No.: 92-67-1)
2	Benzidine (CAS-No.: 92-87-5)
3	4-chloro-o-toluidine (CAS no. 95-69-2)
4	2-naphthylamine (CAS no. 91-59-8)
5	p-Chloroaniline(CAS-No.106-47-8)
6	2,4-Diaminoanisole(CAS-No.615-05-4)

7	4,4'-Diamino diphenyl methane (CAS No.:101-77-9)
8	3,3'-Dichloro benzidine (CAS-No.:91-94-1)
9	3,3'-Dimethoxy benzidine(CAS-No.:119-90-4)
10	3,3'-Dimethyl benzidine(CAS-No.:119-93-7)
11	3,3'-Dimethyl-4,4'-diamino diphenyl methane (CAS-No.:838-88-0)
12	p-Cresidine (CAS-No.:120-71-8)
13	4,4'-Methylene-bis-(2-chloraniline) (CAS No.:101-14-4)
14	4,4'-Oxydianiline (CAS-No.:101-80-4)
15	4,4'-Thiodianiline (CAS-No.:139-65-1)
16	o-Toluidine(CAS-No.:95-53-4)
17	2,4-Diamino toluene(CAS-No.:95-80-7)
18	2,4,5-Trimethyl aniline (CAS-No.:137-17-7)
19	o-aminoazotoluene (CAS-No.:97-56-3)
20	2-amino-4-nitrotoluene (CAS No.:99-55-8)
21	p-amino azo benzene
22	2-methoxy aniline

For **Oeko-tex standard 100**, the list is upgraded to 24 banned list. The below 2 arylamines substances are additionally put into the list.

23	2,4-Xylidine (CAS no. 95-68-1)
24	2,6-Xylidine (CAS no. 87-62-7)

Source: <http://textilebulletin.blogspot.in/2009/02/22-or-24-banned-amines-substances-of.html>
<http://textilescommittee.nic.in/faq-lab.htm>
www.oeko-tex.com