
**Rubber compounding ingredients —
Abbreviated terms**

Ingrédients de mélange du caoutchouc — Termes abrégés

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 45, *Rubber and rubber products*.

This fifth edition cancels and replaces the fourth edition (ISO 6472:2010), which has been technically revised.

The main changes compared to the previous edition are as follows:

- the word 'symbols' has been removed from the title and the scope as there are no symbols being introduced in the standard;
- new ingredients and their abbreviations have been added;
- *N,N'*-ditolyl-*p*-phenylenediamine (DTPD) has been removed from [Table 5](#) due to its hazardous properties.

Rubber compounding ingredients — Abbreviated terms

1 Scope

This document establishes unambiguous abbreviated terms for commonly used rubber compounding ingredients of known, specific chemical composition.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

No terms and definitions are listed in this document.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

4 Notation conventions used in this document

4.1 The abbreviated terms are derived from common usage in industry and commerce rather than from any systematic nomenclature. The list is not intended to conflict with, but rather to act as a supplement to, existing trade names and trademarks.

4.2 When abbreviated terms first appear in a text, they shall be enclosed in parentheses and shall be preceded by the chemical name written in full.

4.3 The list does not purport to be comprehensive, and abbreviated terms for other compounding ingredients will be added in future revisions of this document.

4.4 International Union of Pure and Applied Chemistry (IUPAC) nomenclature is provided where this is available, in addition to the commonly used chemical name or names. In some instances, alternative commonly used chemical names are given where they are recognized. For those materials whose chemical formula cannot be specified, such as reaction products or polymerized products, the identification of IUPAC is “not possible”. Chemical Abstracts Service Registry Number (CAS RN) is also provided unless “not available”.

4.5 Unlike ISO 1043-3, which uses the letter F for phosphates, this document uses the letter P, because P is used universally to designate phosphates and other phosphorous compounds and the letter F is used universally to designate fluorine and its compounds; this usage would thus minimize the confusion among those using this document.

5 Accelerators, co-agents and vulcanizing agents

See [Table 1](#).

Table 1 — Accelerators, co-agents and vulcanizing agents

Number	Abbreviated term	Common chemical name, IUPAC name and CAS RN (where available)
1	AB	ammonium benzoate IUPAC: ammonium benzoate CAS RN: 1863-63-4
2	BA	butyraldehyde-aniline condensate IUPAC: not possible CAS RN: 68411-20-1
3	BiDMC	bismuth dimethyldithiocarbamate IUPAC: bismuth tris(dimethyldithiocarbamate) CAS RN: 21260-46-8
4	BPO	benzoyl peroxide IUPAC: dibenzoyl peroxide CAS RN: 94-36-0
5	BPV	<i>n</i> -butyl bis(4,4- <i>tert</i> -butylperoxy)valerate; 3,3-bis(<i>tert</i> -butylperoxy)butane carboxylic acid <i>n</i> -butyl ester IUPAC: butyl 4,4-bis(<i>tert</i> -butyldioxy)valerate CAS RN: 995-33-5
6	BQD	<i>p</i> -benzoquinone dioxime IUPAC: <i>p</i> -benzoquinone dioxime CAS RN: 105-11-3
7	CBS	<i>N</i> -cyclohexylbenzothiazole-2-sulfenamide; <i>N</i> -cyclohexylbenzothiazyl sulfenamide IUPAC: <i>N</i> -cyclohexyl-1,3-benzothiazole-2-sulfenamide CAS RN: 95-33-0
8	CdDEC	cadmium diethyldithiocarbamate IUPAC: cadmium bis(diethyldithiocarbamate) CAS RN: 14239-68-0
9	CdDMC	cadmium dimethyldithiocarbamate IUPAC: cadmium bis(dimethyldithiocarbamate) CAS RN: 14949-60-1
10	CuDMC	copper dimethyldithiocarbamate IUPAC: copper bis(dimethyldithiocarbamate) CAS RN: 137-29-1
11	CLD	caprolactam disulfide IUPAC: 1,1'-dithiobis(hexahydro-2 <i>H</i> -azepin-2-one) CAS RN: 23847-08-7
12	CMBT	dicyclohexylammonium 1,3-benzothiazole-2-thiolate IUPAC: dicyclohexylammonium 1,3-benzothiazole-2-thiolate CAS RN: 37437-20-0
13	DBA	dibenzylamine IUPAC: dibenzylamine CAS RN: 103-49-1
14	DBPC	1,1-bis(<i>tert</i> -butylperoxy)-3,5,5-trimethylcyclohexane; 1,3,3-trimethyl-5,5-di- <i>tert</i> -butylperoxycyclohexane IUPAC: di- <i>tert</i> -butyl 3,3,5-trimethylcyclohexylidene diperoxide CAS RN: 6731-36-8
15	DBQD	<i>p,p'</i> -dibenzoyl- <i>p</i> -benzoquinone dioxime; quinone dioxime dibenzoate IUPAC: <i>p</i> -benzoquinone bis(<i>O</i> -benzoyloxime) CAS RN: 120-52-5
16	DBTU	1,3-dibutylthiourea IUPAC: 1,3-dibutyl-2-thiourea CAS RN: 109-46-6
17	DBXD	dibutylxanthogen disulfide IUPAC: <i>O,O</i> -dibutyl dithiobis(thioformate) CAS RN: 105-77-1

Table 1 (continued)

Number	Abbreviated term	Common chemical name, IUPAC name and CAS RN (where available)
18	DCBP	2,4-dichlorobenzoyl peroxide IUPAC: bis(2,4-dichlorobenzoyl) peroxide CAS RN: 133-14-2
19	DCBS	<i>N,N</i> -dicyclohexylbenzothiazole-2-sulfenamide; <i>N,N</i> -dicyclohexylbenzothiazyl sulfenamide IUPAC: <i>N,N</i> -cyclohexyl-1,3-benzothiazole-2-sulfenamide CAS RN: 4979-32-2
20	DCP	dicumyl peroxide IUPAC: bis(1-methyl-1-phenylethyl) peroxide CAS RN: 80-43-3
21	DETU	1,3-diethylthiourea IUPAC: 1,3-diethyl-2-thiourea CAS RN: 105-55-5
22	DIBS	<i>N,N</i> -diisopropylbenzothiazole-2-sulfenamide; <i>N,N</i> -diisopropylbenzothiazyl sulfenamide IUPAC: <i>N,N</i> -diisopropyl-1,3-benzothiazole-2-sulfenamide CAS RN: 95-29-4
23	DMBH _a	2,5-dimethyl-2,5-di-(<i>tert</i> -butylperoxy)-hexane; 2,5-di-(<i>tert</i> -butylperoxy)-2,5-dimethylhexane IUPAC: di- <i>tert</i> -butyl-1,1,4,4-tetramethyltetramethylene diperoxide CAS RN: 78-63-7
24	DMBPH _y	2,5-dimethyl-2,5-di-(<i>tert</i> -butylperoxy)-hexyne-3; 2,5-di-(<i>tert</i> -butylperoxy)-2,5-dimethylhexyne-3 IUPAC: di- <i>tert</i> -butyl 1,1,4,4-tetramethylbut-2-ynylene diperoxide CAS RN: 1068-27-5
25	DMTU	1,3-dimethylthiourea IUPAC: 1,3-dimethyl-2-thiourea CAS RN: 534-13-4
26	DOTG	di- <i>o</i> -tolylguanidine IUPAC: 1,3-di- <i>o</i> -tolylguanidine CAS RN: 97-39-2
27	DPG	diphenylguanidine IUPAC: 1,3-diphenylguanidine CAS RN: 102-06-7
28	DPTD	dipentamethylenethiuram disulfide IUPAC: bis[piperidino(thiocarbonyl)] disulfide CAS RN: 94-37-1
29	DPTH	dipentamethylenethiuram hexasulfide IUPAC: bis[piperidino(thiocarbonyl)] hexasulfide CAS RN: 971-15-3
30	DPTM	dipentamethylenethiuram monosulfide IUPAC: di-(piperidino-1-carbothioic) thioanhydride CAS RN: 725-32-6
31	DPTT	dipentamethylenethiuram tetrasulfide IUPAC: bis[piperidino(thiocarbonyl)] tetrasulfide CAS RN: 120-54-7
32	DPTU	1,3-diphenylthiourea IUPAC: 1,3-diphenyl-2-thiourea CAS RN: 102-08-9
33	DTBP	di- <i>tert</i> -butyl peroxide IUPAC: di- <i>tert</i> -butyl peroxide CAS RN: 110-05-4
34	DTBPC	1,1-bis (<i>tert</i> -butylperoxyl) cyclohexane IUPAC: 1,1-bis (<i>tert</i> -butylperoxy) cyclohexane CAS RN: 3006-86-8
35	DTDM	4,4'-dithiodimorpholine IUPAC: 4-(morpholinodithio)morpholine CAS RN: 103-34-4

Table 1 (continued)

Number	Abbreviated term	Common chemical name, IUPAC name and CAS RN (where available)
36	DTGCB	1,3-di- <i>o</i> -tolylguanidinium bis[benzene-1,2-diolato(2-)- <i>O,O'</i>] borate IUPAC: 1,3-di- <i>o</i> -tolylguanidinium bis[benzene-1,2-diolato(2-)- <i>O,O'</i>] borate CAS RN: 16971-82-7
37	DTTU	1,3-di- <i>o</i> -tolylthiourea IUPAC: 1,3-di- <i>o</i> -tolyl-2-thiourea CAS RN: 137-97-3
38	EBPB	ethyl 3,3-bis(<i>tert</i> -butylperoxy)-butyrate IUPAC: ethyl 3,3-bis(<i>tert</i> -butyldioxy) butyrate CAS RN: 55794-20-2
39	FeDMC	iron (III) <i>N,N</i> -dimethyldithiocarbamate IUPAC: iron (III) <i>N,N</i> -dimethyldithiocarbamate CAS RN: 14484-64-1
40	EFA	ethyl chloride, formaldehyde and ammonia reaction product IUPAC: not possible CAS RN: 63512-71-0
41	EPTD	<i>N,N'</i> -diethyl- <i>N,N'</i> -diphenylthiuram disulfide IUPAC: <i>N,N'</i> -diethyl- <i>N,N'</i> -diphenylthiuram disulfide CAS RN: 41365-24-6
42	ETU	ethylene thiourea IUPAC: imidazolidine-2-thione CAS RN: 96-45-7
43	HMD	hexamethylenediamine IUPAC: hexamethylenediamine CAS RN: 124-09-4
44	HMDC	hexamethylenediamine carbamate IUPAC: <i>N</i> -carboxy-1,6-hexanediamine CAS RN: 143-06-6
45	HMMA	<i>N,N'</i> -hexamethylene-bis-methacrylamide IUPAC: <i>N,N'</i> -hexamethylenedimethacrylamide CAS RN: 16069-15-1
46	HMT	hexamethylenetetramine IUPAC: 1,3,5,7-tetraazatricyclo[3.3.1.1.3,7]decane CAS RN: 100-97-0
47	MbOCA	4,4'-methylene-bis(<i>o</i> -chloroaniline) IUPAC: 2,2'-dichloro-4,4'-methylenedianiline CAS RN: 101-14-4
48	pMBPO	di-(4-methylbenzoyl)peroxide IUPAC: bis(4-methylbenzoyl)peroxide CAS RN: 895-85-2
49	MBPP	4-methyl-2,2-bis(<i>tert</i> -butylperoxy)-pentane IUPAC: di- <i>tert</i> -butyl 1,3-dimethylbutylidene diperoxide CAS RN: 36799-28-7
50	MBS	<i>N</i> -oxydiethylenebenzothiazole-2-sulfenamide; 2-morpholinothiobenzothiazole IUPAC: 2-morpholinothio-1,3-benzothiazole CAS RN: 102-77-2
51	MBSS	2-morpholinodithio-1,3-benzothiazole; 4-morpholino-2-benzothiazyl disulfide IUPAC: 2-morpholinodithio-1,3-benzothiazole CAS RN: 95-32-9
52	MBT	2-mercaptobenzothiazole; 2-benzothiazolinethione IUPAC: 1,3-benzothiazole-2-thiol (enol form); 1,3-benzothiazole-2(3H)-thione (keto form) CAS RN: 149-30-4

Table 1 (continued)

Number	Abbreviated term	Common chemical name, IUPAC name and CAS RN (where available)
53	MBTS	benzothiazole disulfide; benzothiazyl disulfide; dibenzothiazole disulfide; dibenzothiazyl disulfide; IUPAC: bis(1,3-benzothiazol-2-yl) disulfide CAS RN: 120-78-5
54	MPBM	<i>N,N'</i> - <i>m</i> -phenylene-bis-maleimide IUPAC: <i>N,N'</i> - <i>m</i> -phenylenedimaleimide CAS RN: 3006-93-7
55	MPTD	<i>N,N'</i> -dimethyl- <i>N,N'</i> -diphenylthiuram disulfide IUPAC: <i>N,N'</i> -dimethyl- <i>N,N'</i> -diphenylthiuram disulfide CAS RN: 10591-84-1
56	MTT	3-methylthiazolidine-thione-2 IUPAC: 3-methylthiazolidine-2-thione CAS RN: 1908-87-8
57	OTBG	<i>o</i> -tolybiguanide IUPAC: 1- <i>o</i> -tolybiguanide CAS RN: 93-69-6
58	OTOS	<i>N</i> -oxydiethylene thiocarbonyl- <i>N'</i> -oxydiethylene sulfenamide IUPAC: 4-[morpholino(thiocarbonyl)thio]-morpholine CAS RN: 13752-51-7
59	PAX	potassium amylxanthate IUPAC: <i>O</i> -pentyl ester carbonodithioic acid, potassium salt (1:1) CAS RN: 2720-73-2
60	PbDAC	lead diamyldithiocarbamate IUPAC: lead bis(dipentyldithiocarbamate) CAS RN: 36501-84-5
61	PbDMC	lead dimethyldithiocarbamate IUPAC: lead bis(dimethyldithiocarbamate) CAS RN: 19010-66-3
62	PEX	potassium ethylxanthate IUPAC: <i>O</i> -ethyl ester carbonodithioic acid, potassium salt (1:1) CAS RN: 140-89-6
63	PIBX	potassium isobutylxanthate IUPAC: <i>O</i> -(2-methylpropyl) ester carbonodithioic acid, potassium salt (1:1) CAS RN: 13001-46-2
64	PMPDC	2-methylpiperidinium 2-methylpiperidine-1-carbodithiolate IUPAC: 2-methylpiperidinium 2-methylpiperidine-1-carbodithiolate CAS RN: 69039-25-4
65	PPDC	piperidinium pentamethyldithiocarbamate; piperidine pentamethyldithiocarbamate IUPAC: piperidinium piperidine-1-carbodithioate CAS RN: 98-77-1
66	SDBC	sodium dibutyldithiocarbamate IUPAC: sodium dibutyldithiocarbamate CAS RN: 136-30-1
67	SDBzC	sodium dibenzylthiocarbamate IUPAC: <i>N,N</i> -bis(phenylmethyl)-carbomodithioic acid, sodium salt (1:1) CAS RN: 55310-46-8
68	SDEC	sodium diethyldithiocarbamate IUPAC: sodium diethyldithiocarbamate CAS RN: 148-18-5
69	SDMC	sodium dimethyldithiocarbamate IUPAC: sodium dimethyldithiocarbamate CAS RN: 128-04-1
70	SeDEC	selenium diethyldithiocarbamate IUPAC: selenium tetrakis(diethyldithiocarbamate) CAS RN: 5456-28-0

Table 1 (continued)

Number	Abbreviated term	Common chemical name, IUPAC name and CAS RN (where available)
71	SeDMC	selenium dimethyldithiocarbamate IUPAC: selenium tetrakis(dimethyldithiocarbamate) CAS RN: 144-34-3
72	SIBX	sodium isobutylxanthate IUPAC: <i>O</i> -(2-methylpropyl) ester carbonodithioic acid, sodium salt (1:1) CAS RN: 25306-75-6
73	SIX	sodium isopropylxanthate IUPAC: sodium <i>O</i> -isopropyl dithiocarbonate CAS RN: 140-93-2
74	SMBT	sodium 2-mercaptobenzothiazole IUPAC: 2(3 <i>H</i>)-benzothiazolethione, sodium salt (1:1) CAS RN: 2492-26-4
75	TAC	triallylcyanurate IUPAC: 2,4,6-triallyloxy-1,3,5-triazine CAS RN: 101-37-1
76	TAIC	triallyl isocyanurate IUPAC: 1,3,5-triallyl-1,3,5-triazine-2,4,6-trione CAS RN: 1025-15-6
77	TBBS	<i>N</i> - <i>tert</i> -butylbenzothiazole-2-sulfenamide; <i>N</i> - <i>tert</i> -butylbenzothiazyl sulfenamide IUPAC: <i>N</i> - <i>tert</i> -butyl-1,3-benzothiazole-2-sulfenamide CAS RN: 95-31-8
78	TBCP	<i>tert</i> -butyl cumyl peroxide; <i>tert</i> -butylperoxyisopropylbenzene IUPAC: <i>tert</i> -butyl 1-methyl-1-phenylethyl peroxide CAS RN: 3457-61-2
79	TBPB	<i>tert</i> -butyl perbenzoate IUPAC: <i>tert</i> -butyl benzenecarboxperoxyate CAS RN: 614-45-9
80	TBSI	<i>N</i> - <i>tert</i> -butyl-bis-2-benzothiazole sulfenamide IUPAC: <i>N</i> -(2-benzothiazolylthio)- <i>N</i> -(1,1-dimethylethyl)-2-benzothiazolesulfenamide CAS RN: 3741-80-8
81	TBTD	tetrabutylthiuram disulfide IUPAC: tetrabutylthiuram disulfide CAS RN: 1634-02-2
82	TBzTD	tetrabenzylthiuram disulfide IUPAC: tetrabenzylthiuram disulfide CAS RN: 10591-85-2
83	TeDEC	tellurium diethyldithiocarbamate IUPAC: tellurium tetrakis(diethyldithiocarbamate) CAS RN: 20941-65-5
84	TESPT	bis-(3-triethoxysilylpropyl) tetrasulfide IUPAC: bis[3-(triethoxysilyl)propyl] tetrasulfide CAS RN: 40372-72-3
85	TETD	tetraethylthiuram disulfide IUPAC: tetraethylthiuram disulfide CAS RN: 97-77-8
86	TIBTD	tetraisobutylthiuram disulfide IUPAC: tetraisobutylthiuram disulfide CAS RN: 3064-73-1
87	TMPTM	trimethylolpropane trimethacrylate IUPAC: 2-ethyl-2-(methacryloyloxymethyl)trimethylene dimethacrylate CAS RN: 3290-92-4
88	TMTD	tetramethylthiuram disulfide IUPAC: tetramethylthiuram disulfide CAS RN: 137-26-8

Table 1 (continued)

Number	Abbreviated term	Common chemical name, IUPAC name and CAS RN (where available)
89	TMTM	tetramethylthiuram monosulfide IUPAC: tetramethylthiuram monosulfide CAS RN: 97-74-5
90	TMU	1,1,3-trimethyl-2-thiourea IUPAC: 1,1,3-trimethyl-2-thiourea CAS RN: 2489-77-2
91	TU	thiourea IUPAC: 2-thiourea CAS RN: 62-56-6
92	ZBX	zinc butylxanthate IUPAC: zinc di- <i>O</i> -butyl bis(dithiocarbonate) CAS RN: 150-88-9
93	ZDBC	zinc dibutyldithiocarbamate IUPAC: zinc bis(dibutyldithiocarbamate) CAS RN: 136-23-2
94	ZDBzC	zinc dibenzylidithiocarbamate IUPAC: zinc bis(dibenzylidithiocarbamate) CAS RN: 14726-36-4
95	ZDBP	zinc dibutyldithiophosphate IUPAC: zinc bis(<i>O,O</i> -dibutyl phosphorodithioate) CAS RN: 6990-43-8
96	ZDEC	zinc diethyldithiocarbamate IUPAC: zinc bis(diethyldithiocarbamate) CAS RN: 14324-55-1
97	ZDIBC	zinc diisobutyldithiocarbamate IUPAC: zinc diisobutyl bis(dithiocarbamate) CAS RN: 36190-62-2
98	ZDINC	zinc diisononyldithiocarbamate IUPAC: bis-[<i>N,N</i> -bis(3,5,5-trimethylhexyl)carbomodithioato- κ S, κ S']-zinc CAS RN: 84604-96-6
99	ZDMC	zinc dimethyldithiocarbamate IUPAC: zinc bis(dimethyldithiocarbamate) CAS RN: 137-30-4
100	ZDNC	zinc dinonyldithiocarbamate IUPAC: zinc bis(dinonyldithiocarbamate) CAS RN: 14244-40-7
101	ZEHP	zinc ethylhexyl-butylidithiophosphate IUPAC: zinc bis[<i>O</i> -butyl- <i>O</i> -(2-ethylhexyl)phosphorodithioate] CAS RN: 26566-95-0
102	ZEPC	zinc ethylphenyldithiocarbamate IUPAC: zinc bis[ethyl(phenyl)dithiocarbamate] CAS RN: 14634-93-6
103	ZEX	zinc ethylxanthate IUPAC: zinc di- <i>O</i> -ethyl bis(dithiocarbonate) CAS RN: 13435-48-8
104	ZIX	zinc isopropylxanthate IUPAC: zinc di- <i>O</i> -isopropyl bis(dithiocarbonate) CAS RN: 1000-90-4
105	ZMBT	zinc 2-mercaptobenzothiazole IUPAC: zinc bis(1,3-benzothiazole-2-thiolate) CAS RN: 155-04-4
106	ZPMC	zinc pentamethylenedithiocarbamate IUPAC: zinc bis(piperidino-1-carbodithioate) CAS RN: 13878-54-1

6 Activators and process aids

See [Table 2](#).

Table 2 — Activators and process aids

Number	Abbreviated term	Common chemical name, IUPAC name and CAS RN (where available)
1	DBDPD	<i>o,o'</i> -bis(benzamido)diphenyldisulfane IUPAC: <i>o,o'</i> -bis(benzamido)diphenyldisulfane CAS RN: 135-57-9
2	DEA	diethanolamine IUPAC: 2,2'-iminodiethanol CAS RN: 111-42-2
3	DEG	diethylene glycol IUPAC: 2,2'-oxydiethanol CAS RN: 111-46-6
4	PEG	polyethylene glycol IUPAC: α -hydro- ω -hydroxypoly(oxyethylene) CAS RN: 25322-68-3
5	PPG	polypropylene glycol IUPAC: α -hydro- ω -hydroxypoly(oxypropylene) CAS RN: 25322-69-4
6	PVME	polyvinyl methyl ether IUPAC: poly(methoxyethylene) CAS RN: 9003-09-2
7	SPCP	sodium pentachlorophenate IUPAC: sodium pentachlorophenoxide CAS RN: 131-52-2
8	TEA	triethanolamine IUPAC: 2,2',2''-nitrilotriethanol CAS RN: 102-71-6
9	ZBBT	zinc 2-benzamidobenzenethiolate IUPAC: zinc 2-benzamidobenzenethiolate CAS RN: 30429-79-9
10	ZEH	zinc 2-ethylhexanoate; zinc octanoate IUPAC: zinc bis(2-ethylhexanoate) CAS RN: 136-53-8

7 Vulcanization retarders

See [Table 3](#).

Table 3 — Vulcanization retarders

Number	Abbreviated term	Common chemical name, IUPAC name and CAS RN (where available)
1	CTP	<i>N</i> -cyclohexylthiophthalimide IUPAC: <i>N</i> -(cyclohexylthio)phthalimide CAS RN: 17796-82-6
2	HITM	hexaisopropylthiomelamine IUPAC: hexakis(isopropylthio)-1,3,5-triazine-2,4,6-triamine CAS RN: 86098-92-2
3	NDPA	<i>N</i> -nitrosodiphenylamine IUPAC: <i>N</i> -nitrosodiphenylamine CAS RN: 86-30-6
4	PHT	phthalic anhydride IUPAC: phthalic anhydride CAS RN: 85-44-9

8 Antidegradants, antioxidants and antiozonants

8.1 Naming conventions for bisphenol antidegradants

An abbreviated term for a bisphenol antidegradant consists of a combination of letter and numerical symbols as described in [Table 4](#).

Table 4 — Naming conventions for bisphenol antidegradants

Naming convention for	Abbreviated term	Description
Position of bridge atoms on phenolic ring	<i>o</i> -	ortho
	<i>m</i> -	meta
	<i>p</i> -	para
Nature of the bridge linking two phenol molecules	M	methylene
	B	butylidene
	IB	isobutylidene
	IP	isopropylidene
	T	thio
Identification of the bisphenol structure	Bp	bisphenol structure
Nature of substituent alkyl groups on the phenolic ring, with the number indicating the number of carbon atoms in the group	1	methyl
	2	ethyl
	4	<i>tert</i> -butyl
	9	nonyl
	C	cyclohexyl

8.2 Abbreviated terms and names of antidegradants, antioxidants and antiozonants

See [Table 5](#).

Table 5 — Antidegradants, antioxidants and antiozonants

Number	Abbreviated term	Common chemical name, IUPAC name and CAS RN (where available)
1	AANA	aldol- α -naphthylamine IUPAC: not possible CAS RN: not available
2	ADPA	acetone-diphenylamine condensate IUPAC: not possible CAS RN: 68412-48-6
3	APPD	<i>N</i> -alkyl- <i>N'</i> -phenyl- <i>p</i> -phenylenediamine IUPAC: not possible, generic name, not a single compound CAS RN: not available
4	<i>p</i> -BBp14	4,4'-butylidene-bis(6- <i>tert</i> -butyl- <i>m</i> -cresol) IUPAC: 6,6'-di- <i>tert</i> -butyl-4,4'-butylidenedi- <i>m</i> -cresol CAS RN: 85-60-9
5	<i>o</i> -1BBp11	2,2'-isobutylidene-bis-(4,6-dimethylphenol) IUPAC: 2,2'-isobutylidene-4,4',6,6'-tetramethyldiphenol CAS RN: 33145-10-7
6	BHA	butyl hydroxyanisole IUPAC: a mixture of 2- <i>tert</i> -butyl-4-hydroxyanisole and 3- <i>tert</i> -butyl-4-hydroxyanisole CAS RN: 25013-16-5
7	BHT	2,6-di- <i>tert</i> -butyl-4-methylphenol; butylated hydroxytoluene IUPAC: 2,6-di- <i>tert</i> -butyl- <i>p</i> -cresol CAS RN: 128-37-0

Table 5 (continued)

Number	Abbreviated term	Common chemical name, IUPAC name and CAS RN (where available)
8	CPPD	<i>N</i> -cyclohexyl- <i>N'</i> -phenyl- <i>p</i> -phenylenediamine IUPAC: <i>N</i> -cyclohexyl- <i>N'</i> -phenyl- <i>p</i> -phenylenediamine CAS RN: 101-87-1
9	DAHQ	2,5-di- <i>tert</i> -amylhydroquinone IUPAC: 2,5-di- <i>tert</i> -pentylhydroquinone CAS RN: 79-74-3
10	DBHQ	2,5-di- <i>tert</i> -butylhydroquinone IUPAC: 2,5-di- <i>tert</i> -butylhydroquinone CAS RN: 88-58-4
11	DCD	4,4'-bis(1-methyl-1-phenylethyl)-diphenylamine IUPAC: 4,4'-bis(1-methyl-1-phenylethyl)-diphenylamine CAS RN: 10081-67-1
12	DLTDP	dilauryl thiodipropionate IUPAC: didodecyl-3,3'-thiodipropionate CAS RN: 123-28-4
13	DMHPD	<i>N,N'</i> -bis(1-methylheptyl)- <i>p</i> -phenylenediamine IUPAC: <i>N,N'</i> -bis(1-methylheptyl)- <i>p</i> -phenylenediamine CAS RN: 103-96-8
14	DNPD	<i>N,N'</i> -di-2-naphthyl- <i>p</i> -phenylenediamine IUPAC: <i>N,N'</i> -di-2-naphthyl- <i>p</i> -phenylenediamine CAS RN: 93-46-9
15	DPA	diphenylamine IUPAC: diphenylamine CAS RN: 122-39-4
16	DPPD	<i>N,N'</i> -diphenyl- <i>p</i> -phenylenediamine IUPAC: <i>N,N'</i> -diphenyl- <i>p</i> -phenylenediamine CAS RN: 74-31-7
17	DSTDP	distearyl thiodipropionate IUPAC: dioctadecyl-3,3'-thiodipropionate CAS RN: 693-36-7
18	ETMQ	6-ethoxy-1,2-dihydro-2,2,4-trimethylquinoline IUPAC: 6-ethoxy-1,2-dihydro-2,2,4-trimethylquinoline CAS RN: 91-53-2
19	<i>p</i> -IPBp(4) _n	polybutylated bisphenol A IUPAC: not possible CAS RN: 68784-69-0
20	IPDPA	<i>p</i> -isopropoxydiphenylamine IUPAC: 4-isopropoxy- <i>N</i> -phenylaniline CAS RN: 101-73-5
21	IPPD	<i>N</i> -isopropyl- <i>N'</i> -phenyl- <i>p</i> -phenylenediamine IUPAC: <i>N</i> -isopropyl- <i>N'</i> -phenyl- <i>p</i> -phenylenediamine CAS RN: 101-72-4
22	MBI	2-mercaptobenzimidazole IUPAC: benzimidazole-2-thiol CAS RN: 583-39-1
23	<i>o</i> -MBp1C	2,2'-methylene-bis(4-methyl-6-cyclohexylphenol) IUPAC: 6,6'-dicyclohexyl-2,2'-methylenedi- <i>p</i> -cresol CAS RN: 4066-02-8
24	<i>o</i> -MBp1(1C)	2,2'-methylene-bis[6-(1-methyl cyclohexyl)- <i>p</i> -cresol] IUPAC: 6,6'-bis(1-methylcyclohexyl)-2,2'-methylenedi- <i>p</i> -cresol CAS RN: 77-62-3
25	<i>o</i> -MBp14	2,2'-methylene-bis(4-methyl-6- <i>tert</i> -butylphenol) IUPAC: 6,6'-di- <i>tert</i> -butyl-2,2'-methylenedi- <i>p</i> -cresol CAS RN: 119-47-1
26	<i>o</i> -MBp19	2,2'-methylene-bis(4-methyl-6-nonylphenol) IUPAC: 6,6'-dinonyl-2,2'-methylenedi- <i>p</i> -cresol CAS RN: 7786-17-6

Table 5 (continued)

Number	Abbreviated term	Common chemical name, IUPAC name and CAS RN (where available)
27	<i>o</i> -MBp24	2,2'-methylene-bis(4-ethyl-6- <i>tert</i> -butylphenol) IUPAC: 6,6'-di- <i>tert</i> -butyl-4,4'-diethyl-2,2'-methylenediphenol CAS RN: 88-24-4
28	<i>p</i> -MBp44	4,4'-methylene-bis(2,6-di- <i>tert</i> -butylphenol) IUPAC: 2,2',6,6'-tetra- <i>tert</i> -butyl-4,4'-methylenediphenol CAS RN: 118-82-1
29	MMBI	2-mercapto-4(or 5)-methylbenzimidazole IUPAC: 4-methylbenzimidazole-2-thiol 5-methylbenzimidazole-2-thiol CAS RN: 27231-33-0 (4-methyl) 27231-36-3 (5-methyl)
30	NDIBC	nickel dibutylidithiocarbamate IUPAC: nickel bis(dibutylidithiocarbamate) CAS RN: 13927-77-0
31	NDINC	nickel diisononyldithiocarbamate IUPAC: bis-(<i>N,N</i> -diisononylcarbomodithioato- κ S, κ S')-nickel CAS RN: 85604-95-5, 85298-61-9
32	NDMC	nickel dimethyldithiocarbamate IUPAC: bis-(<i>N,N</i> -dimethylcarbomodithioato- κ S, κ S')-nickel-(SP-4-1) CAS RN: 15521-65-0
33	ODPA	octylated diphenylamine IUPAC: not possible CAS RN: 101-67-7; 68411-46-1
34	PAN	<i>N</i> -phenyl- α -naphthylamine IUPAC: <i>N</i> -(1-naphthyl)aniline CAS RN: 90-30-2
35	PBN	<i>N</i> -phenyl- β -naphthylamine IUPAC: <i>N</i> -(2-naphthyl)aniline CAS RN: 135-88-6
36	SDPA	styrenated diphenylamine IUPAC: not possible CAS RN: 68442-68-2
37	SPH	styrenated phenol IUPAC: not possible CAS RN: 61788-44-1
38	<i>p</i> -TBp14	4,4'-thio-bis(2- <i>tert</i> -butyl- <i>m</i> -cresol) IUPAC: 2,2'-di- <i>tert</i> -butyl-4,4'-thiodi(<i>m</i> -cresol) CAS RN: 96-69-5
39	TMPTA	2,4,6-tris-(<i>N</i> -1,4-dimethylpentyl- <i>p</i> -phenylenediamino)-1,3,5-triazine IUPAC: <i>N,N',N''</i> -tris[4-[(1,4-dimethylpentyl)amino]phenyl]-1,3,5-triazine-2,4,6-tri-amine CAS RN: 121246-28-4
40	TMQ	polymerized 2,2,4-trimethyl-1,2-dihydroquinoline IUPAC: not possible CAS RN: 26780-96-1
41	TNPP	tri(nonylphenyl) phosphite IUPAC: tris(<i>x</i> -nonylphenyl) phosphite, where <i>x</i> denotes <i>o</i> , <i>m</i> , <i>p</i> or mixture CAS RN: 26523-78-4
42	TSDPA	4-(4-toluenesulfonylamido)-diphenylamine IUPAC: 4-(4-toluenesulfonylamido)-diphenylamine CAS RN: 100-93-6
43	ZMBI	zinc 2-mercaptobenzimidazole IUPAC: zinc bis(benzimidazole-2-thiolate) CAS RN: 3030-80-6
44	ZMMBI	zinc 2-mercapto-4(or 5)-methylbenzimidazole IUPAC: zinc bis(4-methylbenzimidazole-2-thiolate) zinc bis(5-methylbenzimidazole-2-thiolate) CAS RN: 61617-00-3

Table 5 (continued)

Number	Abbreviated term	Common chemical name, IUPAC name and CAS RN (where available)
45	44PD	<i>N,N'</i> -di- <i>sec</i> -butyl- <i>p</i> -phenylenediamine IUPAC: <i>N,N'</i> -bis(1-methylpropyl)- <i>p</i> -phenylenediamine CAS RN: 101-96-2
46	6PPD	<i>N</i> -1,3-dimethylbutyl- <i>N'</i> -phenyl- <i>p</i> -phenylenediamine IUPAC: <i>N</i> -1,3-dimethylbutyl- <i>N'</i> -phenyl- <i>p</i> -phenylenediamine CAS RN: 793-24-8
47	7PPD	<i>N</i> -1,4-dimethylpentyl- <i>N'</i> -phenyl- <i>p</i> -phenylenediamine IUPAC: <i>N</i> -1,4-dimethylpentyl- <i>N'</i> -phenyl- <i>p</i> -phenylenediamine CAS RN: 3081-01-4
48	77PD	<i>N,N'</i> -bis(1,4-dimethylpentyl)- <i>p</i> -phenylenediamine IUPAC: <i>N,N'</i> -bis(1,4-dimethylpentyl)- <i>p</i> -phenylenediamine CAS RN: 3081-14-9
49	8HPPD	<i>N</i> -ethylhexyl- <i>N'</i> -phenyl- <i>p</i> -phenylenediamine IUPAC: <i>N</i> -(2-ethylhexyl)- <i>N'</i> -phenyl- <i>p</i> -phenylenediamine CAS RN: 82209-88-9
50	88PD	<i>N,N'</i> -dioctyl- <i>p</i> -phenylenediamine IUPAC: <i>N,N'</i> -bis(1-ethyl-3-methylpentyl)- <i>p</i> -phenylenediamine CAS RN: 1241-28-7 The specific octyl isomer is given in the IUPAC name, the use of which is encouraged in order to avoid confusion with the 1-methylheptyl isomer in DMHPD.

9 Plasticizers and softeners

9.1 Naming conventions

9.1.1 The list includes those plasticizers most commonly used in rubber compounding. Additional abbreviated terms are given in ISO 1043-3.

9.1.2 Unless otherwise indicated, the alkyl groups are *n*-alkyl groups and the phthalates are esters of *o*-phthalic acid.

9.1.3 No letter symbol is used in the abbreviated terms to indicate normal (*n*-) linear alcohols. For branched (iso-) alcohols, the additional letter I is used, with one exception: in view of worldwide usage of the letter O for 2-ethylhexyl (for example, in DOA and DOP), this practice is observed in this document. Because of this dual usage, the application of the convention specified in 9.1.2 is most important.

9.1.4 For plasticizers based on di-esters of the same alcohol, the first letter of the abbreviated term is D.

9.1.5 Mixtures of plasticizers are not considered in this document.

9.1.6 Several plasticizers having "iso-" names indicating branched groups may consist of several isomers. For this reason, no single IUPAC name can describe the detailed chemical composition of each of these plasticizers.

9.2 Abbreviated terms and names of plasticizers and softeners

See [Table 6](#).

Table 6 — Plasticizers and softeners

Number	Abbreviated term	Common chemical name, IUPAC name and CAS RN (where available)
1	BBP	benzyl butyl phthalate IUPAC: benzyl butyl phthalate CAS RN: 85-68-7
2	BOA	benzyl octyl adipate IUPAC: benzyl 2-ethylhexyl adipate CAS RN: 3089-55-2
3	BOP	butyl octyl phthalate IUPAC: butyl 2-ethylhexyl phthalate CAS RN: 85-69-8
4	DBP	dibutyl phthalate IUPAC: dibutyl phthalate CAS RN: 84-74-2
5	DBS	dibutyl sebacate IUPAC: dibutyl sebacate CAS RN: 109-43-3
6	DEP	diethyl phthalate IUPAC: diethyl phthalate CAS RN: 84-66-2
7	DIBA	diisobutyl adipate IUPAC: diisobutyl adipate CAS RN: 141-04-8
8	DIBP	diisobutyl phthalate IUPAC: diisobutyl phthalate CAS RN: 84-69-5
9	DIDA	diisodecyl adipate IUPAC: see 9.1.6 CAS RN: 27178-16-1
10	DIDP	diisodecyl phthalate IUPAC: see 9.1.6 CAS RN: 26761-40-0
11	DIOA	diisooctyl adipate IUPAC: see 9.1.6 CAS RN: 1330-86-5
12	DIOP	diisooctyl phthalate IUPAC: see 9.1.6 CAS RN: 27554-26-3
13	DMP	dimethyl phthalate IUPAC: dimethyl phthalate CAS RN: 131-11-3
14	DMS	dimethyl sebacate IUPAC: dimethyl sebacate CAS RN: 106-79-6
15	DOA	dioctyl adipate IUPAC: bis(2-ethylhexyl) adipate CAS RN: 103-23-1
16	DOP	dioctyl phthalate IUPAC: bis(2-ethylhexyl) phthalate CAS RN: 117-81-7
17	DOS	dioctyl sebacate IUPAC: bis(2-ethylhexyl) sebacate CAS RN: 122-62-3
18	DOTP	dioctyl terephthalate; bis(2-ethylhexyl) terephthalate IUPAC: bis(2-ethylhexyl) terephthalate CAS RN: 6422-86-2