INTERNATIONAL STANDARD

ISO 6472

Fourth edition
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Rubber compounding ingredients — Symbols and abbreviated terms

Ingrédients de mélange du caoutchouc — Symboles et termes abrégés

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Foreword

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International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 6472 was prepared by Technical Committee ISO/TC 45, *Rubber and rubber products*.

This fourth edition cancels and replaces the third edition (ISO 6472:2004), which has been technically revised.

Rubber compounding ingredients — Symbols and abbreviated terms

1 Scope

This International Standard establishes unambiguous symbols and abbreviated terms for commonly used rubber compounding ingredients of known, specific chemical composition.

2 Notation conventions used in this International Standard

2.1 The symbols and 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.

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

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

2.4 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. Where available, a Chemical Abstracts Service Registry Number (CAS RN) is also provided.

2.5 Unlike ISO 1043-3, which uses the letter F for phosphates, this International Standard 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 International Standard.

3 Accelerators, co-agents and vulcanizing agents

Table 1 — Accelerators, co-agents and vulcanizing agents

Abbreviated term	Common chemical name, IUPAC name and CAS RN (where available)
BA	butyraldehyde-aniline condensate IUPAC: not possible CAS RN: 65411-20-1
BiDMC	bismuth dimethyldithiocarbamate IUPAC: bismuth bis(dimethyldithiocarbamate) CAS RN: 21260-46-8
BPO	benzoyl peroxide IUPAC: dibenzoyl peroxide CAS RN: 94-36-0

Table 1 (*continued*)

Abbreviated term	Common chemical name, IUPAC name and CAS RN (where available)
BPV	*n*-butyl bis(4,4-*tert*-butylperoxy)valerate; 3,3-bis(*tert*-butylperoxy)butane carboxylic acid *n*-butyl ester IUPAC: butyl 4,4-bis(*tert*-butyldioxy)valerate CAS RN: 995-33-5
BQD	*p*-benzoquinone dioxime IUPAC: same CAS RN: 105-11-3
CBS	*N*-cyclohexylbenzothiazole-2-sulfenamide; *N*-cyclohexylbenzothiazyl sulfenamide IUPAC: *N*-cyclohexyl-1,3-benzothiazole-2-sulfenamide CAS RN: 95-33-0
CdDEC	cadmium diethyldithiocarbamate IUPAC: cadmium bis(diethyldithiocarbamate) CAS RN: 14239-68-0
CdDMC	cadmium dimethyldithiocarbamate IUPAC: cadmium bis(dimethyldithiocarbamate) CAS RN: 14949-60-1
CuDMC	copper dimethyldithiocarbamate IUPAC: copper bis(dimethyldithiocarbamate) CAS RN: 137-29-1
CLD	caprolactam disulfide IUPAC: 1,1'-dithiobis(hexahydro-2*H*-azapin-2-one) CAS RN: 23847-08-7
DBA	dibenzylamine IUPAC: same CAS RN: 103-49-1
DBPC	1,1-bis(*tert*-butylperoxy)-3,5,5-trimethylcyclohexane; 1,3,3-trimethyl-5,5-di-*tert*-butylperoxycyclohexane IUPAC: di-*tert*-butyl 3,3,5-trimethylcylohexylidene diperoxide CAS RN: 6731-36-8
DBQD	*p*,*p*′-dibenzoyl-*p*-benzoquinone dioxime; quinone dioxime dibenzoate IUPAC: *p*-benzoquinone bis(*O*-benzoyloxime) CAS RN: 120-52-5
DBTU	1,3-dibutylthiourea IUPAC: 1,3-dibutyl-2-thiourea CAS RN: 109-46-6
DBXD	dibutylxanthogen disulfide IUPAC: *O*,*O*-dibutyl dithiobis(thioformate) CAS RN: 105-77-1
DCBP	2,4-dichlorobenzoyl peroxide IUPAC: bis(2,4-dichlorobenzoyl) peroxide CAS RN: 133-14-2
DCBS	*N*,*N*-dicyclohexylbenzothiazole-2-sulfenamide; *N*,*N*-dicyclohexylbenzothiazyl sulfenamide IUPAC: *N*,*N*-cyclohexyl-1,3-benzothiazole-2-sulfenamide CAS RN: 4979-32-2
DCP	dicumyl peroxide IUPAC: bis(1-methyl-1-phenylethyl) peroxide CAS RN: 80-43-3

Table 1 (*continued*)

Abbreviated term	Common chemical name, IUPAC name and CAS RN (where available)
DETU	1,3-diethylthiourea IUPAC: 1,3-diethyl-2-thiourea CAS RN: 105-55-5
DIBS	*N*,*N*-diisopropylbenzothiazole-2-sulfenamide; *N*,*N*-diisopropylbenzothiazyl sulfenamide IUPAC: *N*,*N*-diisopropyl-1,3-benzothiazole-2-sulfenamide CAS RN: 95-29-4
DMBHa	2,5-dimethyl-2,5-di-(*tert*-butylperoxy)-hexane; 2,5-di-(*tert*-butylperoxy)-2,5-dimethylhexane IUPAC: di-*tert*-butyl-1,1,4,4-tetramethyltetramethylene diperoxide CAS RN: 78-63-7
DMBPHy	2,5-dimethyl-2,5-di-(*tert*-butylperoxy)-hexyne-3; 2,5-di-(*tert*-butylperoxy)-2,5-dimethylhexyne-3 IUPAC: di-*tert*-butyl 1,1,4,4-tetramethylbut-2-ynylene diperoxide CAS RN: 1068-27-5
DMTU	1,3-dimethylthiourea IUPAC: 1,3-dimethyl-2-thiourea CAS RN: 534-13-4
DOTG	di-*o*-tolylguanidine IUPAC: 1,3-di-*o*-tolylguanidine CAS RN: 97-39-2
DPG	diphenylguanidine IUPAC: 1,3-diphenylguanidine CAS RN: 102-06-7
DPTD	dipentamethylenethiuram disulfide IUPAC: bis[piperidino(thiocarbonyl)] disulfide CAS RN: 94-37-1
DPTH	dipentamethylenethiuram hexasulfide IUPAC: bis[piperidino(thiocarbonyl)] hexasulfide CAS RN: 971-15-3
DPTM	dipentamethylenethiuram monosulfide IUPAC: di-(piperidino-1-carbothioic) thioanhydride CAS RN: 725-32-6
DPTT	dipentamethylenethiuram tetrasulfide IUPAC: bis[piperidino(thiocarbonyl)] tetrasulfide CAS RN: 120-54-7
DPTU	1,3-diphenylthiourea IUPAC: 1,3-diphenyl-2-thiourea CAS RN: 102-08-9
DTBP	di-*tert*-butyl peroxide IUPAC: same CAS RN: 110-05-4
DTBPC	1,1-bis (*tert*-butylperoxyl) cyclohexane IUPAC: di-*tert*-butyl cyclohexylidene diperoxide CAS RN: 3006-86-8
DTDM	4,4'-dithiodimorpholine IUPAC: 4-(morpholinodithio)morpholine CAS RN: 103-34-4
DTTU	1,3-di-*o*-tolylthiourea IUPAC: 1,3-di-*o*-tolyl-2-thiourea CAS RN: 137-97-3

Table 1 (*continued*)

Abbreviated term	Common chemical name, IUPAC name and CAS RN (where available)
EBPB	ethyl 3,3-bis(*tert*-butylperoxy)-butyrate IUPAC: ethyl 3,3-bis(*tert*-butyldioxy) butyrate CAS RN: 55974-20-2
EFA	ethyl chloride, formaldehyde and ammonia reaction product IUPAC: not possible CAS RN: 63512-71-0
EPTD	*N*,*N*′-diethyl-*N*,*N*′-diphenylthiuram disulfide IUPAC: same CAS RN: 41365-24-6
ETU	ethylene thiourea IUPAC: imidazoline-2-thione CAS RN: 96-45-7
HMD	hexamethylenediamine IUPAC: same CAS RN: 124-09-4
HMDC	hexamethylenediamine carbamate IUPAC: *N*-carboxy-1,6-hexanediamine CAS RN: 143-06-6
HMMA	*N*,*N*′-hexamethylene-bis-methacrylamide IUPAC: *N*,*N*′-hexamethylenedimethacrylamide CAS RN: 16069-15-1
HMT	hexamethylenetetramine IUPAC: 1,3,5,7-tetraazatricyclo[3.3.1.1^{3,7}]decane CAS RN: 100-97-0
MbOCA	4,4'-methylene-bis(*o*-chloroaniline) IUPAC: 2,2'-dichloro-4,4'-methylenedianiline CAS RN: 101-14-4
pMBPO	di-(4-methylbenzoyl)peroxide IUPAC: bis(4-methylbenzoyl)peroxide CAS RN: 895-85-2
MBPP	4-methyl-2,2-bis(*tert*-butylperoxy)-pentane IUPAC: di-*tert*-butyl 1,3-dimethylbutylidene diperoxide CAS RN: 36799-28-7
MBS	*N*-oxydiethylenebenzothiazole-2-sulfenamide; 2-morpholinothiobenzothiazole IUPAC: 2-morpholino-1,3-benzothiazole CAS RN: 102-77-2
MBSS	2-morpholinodithio-1,3-benzothiazole; 4-morpholino-2-benzothiazyl disulfide IUPAC: 2-morpholinodithio-1,3-benzothiazole CAS RN: 95-32-9
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
MBTS	benzothiazole disulfide; benzothiazyl disulfide IUPAC: bis(1,3-benzothiazol-2-yl) disulfide CAS RN: 120-78-5

Table 1 (*continued*)

Abbreviated term	Common chemical name, IUPAC name and CAS RN (where available)
MPBM	*N*,*N*′-*m*-phenylene-bis-maleimide IUPAC: *N*,*N*′-*m*-phenylenedimaleimide CAS RN: 3006-93-7
MPTD	*N*,*N*′-dimethyl-*N*,*N*′-diphenylthiuram disulfide IUPAC: same CAS RN: 10591-84-1
MTT	3-methylthiazolidine-thione-2 IUPAC: 3-methylthiazolidine-2-thione CAS RN: 1908-87-8
OTBG	*o*-tolylbiguanide IUPAC: 1-*o*-tolylbiguanide CAS RN: 93-69-6
OTOS	*N*-oxydiethylene thiocarbamyl-*N*′-oxydiethylene sulfenamide IUPAC: 4-[morpholino(thiocarbonyl)thio]-morpholine CAS RN: 13752-51-7
PAX	potassium amylxanthate IUPAC: *O*-pentyl ester carbonodithioic acid, potassium salt (1:1) CAS RN: 2720-73-2
PbDAC	lead diamyldithiocarbamate IUPAC: lead bis(dipentyldithiocarbamate) CAS RN: 36501-84-5
PbDMC	lead dimethyldithiocarbamate IUPAC: lead bis(dimethyldithiocarbamate) CAS RN: 19010-66-3
PEX	potassium ethylxanthate IUPAC: *O*-ethyl ester carbonodithioic acid, potassium salt (1:1) CAS RN: 140-89-6
PIBX	potassium isobutylxanthate IUPAC: *O*-(2-methylpropyl) ester carbonodithioic acid, potassium salt (1:1) CAS RN: 13001-46-2
PPDC	piperidinium pentamethylendithiocarbamate; piperidine pentamethylendithiocarbamate IUPAC: piperidinium piperidine-1-carbodithioate CAS RN: 98-77-1
SDBC	sodium dibutyldithiocarbamate IUPAC: same CAS RN: 136-30-1
SDBzC	sodium dibenzyldithiocarbamate IUPAC: *N*,*N*-bis(phenylmethyl)-carbamodithioic acid, sodium salt (1:1) CAS RN: 55310-46-8
SDEC	sodium diethyldithiocarbamate IUPAC: same CAS RN: 148-18-5
SDMC	sodium dimethyldithiocarbamate IUPAC: same CAS RN: 128-04-1
SeDEC	selenium diethyldithiocarbamate IUPAC: selenium tetrakis(diethyldithiocarbamate) CAS RN: 136-92-5

Table 1 (*continued*)

Abbreviated term	Common chemical name, IUPAC name and CAS RN (where available)
SeDMC	selenium dimethyldithiocarbamate IUPAC: selenium tetrakis(dimethyldithiocarbamate) CAS RN: 144-34-3
SIBX	sodium isobutylxanthate IUPAC: *O*-(2-methylpropyl) ester carbonodithioic acid, sodium salt (1:1) CAS RN: 25306-75-6
SIX	sodium isopropylxanthate IUPAC: sodium *O*-isopropyl dithiocarbonate CAS RN: 140-93-2
SMBT	sodium 2-mercaptobenzothiazole IUPAC: 2(3*H*)-benzothiazolethione, sodium salt (1:1) CAS RN: 2492-26-4
TAC	triallylcyanurate IUPAC: 2,4,6-triallyloxy-1,3,5-triazine CAS RN: 101-37-1
TAIC	triallyl isocyanurate IUPAC: 1,3,5-triallyl-1,3,5-triazine-2,4,6-trione CAS RN: 1025-15-6
TBBS	*N-tert*-butylbenzothiazole-2-sulfenamide; *N-tert*-butylbenzothiazyl sulfenamide IUPAC: *N-tert*-butyl-1,3-benzothiazole-2-sulfenamide CAS RN: 95-31-8
TBCP	*tert*-butyl cumyl peroxide; *tert*-butylperoxyisopropylbenzene IUPAC: *tert*-butyl 1-methyl-1-phenylethyl peroxide CAS RN: 3457-61-2
TBPB	*tert*-butyl perbenzoate IUPAC: same CAS RN: 614-45-9
TBSI	*N-tert*-butyl-bis-2-benzothiazole sulfenamide IUPAC: *N-2*(-benzothiazolylthio)-*N*-1,1-(dimethylethyl)-2-benzothiazolesulfenamide CAS RN: 3741-80-8
TBTD	tetrabutylthiuram disulfide IUPAC: same CAS RN: 1634-02-2
TBzTD	tetrabenzylthiuram disulfide IUPAC: same CAS RN: 10591-85-2
TeDEC	tellurium diethyldithiocarbamate IUPAC: tellurium tetrakis(diethyldithiocarbamate) CAS RN: 20941-65-5
TESPT	bis-(3-triethoxysilylpropyl) tetrasulfide IUPAC: bis[3-(triethoxysilyl)propyl] tetrasulfide CAS RN: 40372-72-3
TETD	tetraethylthiuram disulfide IUPAC: same CAS RN: 97-77-8
TIBTD	tetraisobutylthiuram disulfide IUPAC: same CAS RN: 3064-73-1

Table 1 (*continued*)

Abbreviated term	Common chemical name, IUPAC name and CAS RN (where available)
TMPTM	trimethylolpropane trimethacrylate IUPAC: 2-ethyl-2-(methacryloyloxymethyl)trimethylene dimethacrylate CAS RN: 3290-92-4
TMTD	tetramethylthiuram disulfide IUPAC: same CAS RN: 137-26-8
TMTM	tetramethylthiuram monosulfide IUPAC: same CAS RN: 97-74-5
TU	thiourea IUPAC: 2-thiourea CAS RN: 62-56-6
ZBX	zinc butylxanthate IUPAC: zinc di-*O*-butyl bis(dithiocarbonate) CAS RN: 150-88-9
ZDBC	zinc dibutyldithiocarbamate IUPAC: zinc bis(dibutyldithiocarbamate) CAS RN: 136-23-2
ZDBzC	zinc dibenzyldithiocarbamate IUPAC: zinc bis(dibenzyldithiocarbamate) CAS RN: 14726-36-4
ZDBP	zinc dibutyldithiophosphate IUPAC: zinc bis(*O*,*O*-dibutyl phosphorodithioate) CAS RN: 6990-43-8
ZDEC	zinc diethyldithiocarbamate IUPAC: zinc bis(diethyldithiocarbamate) CAS RN: 14324-55-1
ZDIBC	zinc diisobutyldithiocarbamate IUPAC: zinc diisobutyl bis(dithiocarbamate) CAS RN: 36190-62-2
ZDMC	zinc dimethyldithiocarbamate IUPAC: zinc bis(dimethyldithiocarbamate) CAS RN: 137-30-4
ZDNC	zinc dinonyldithiocarbamate IUPAC: zinc bis(dinonyldithiocarbamate) CAS RN: 14244-40-7
ZDINC	zinc diisononyldithiocarbamate IUPAC: bis-[*N*,*N*-bis(3,5,5-trimethylhexyl)carbamodithioato-κS,κS']-zinc CAS RN: 84604-96-6
ZEHBP	zinc ethylhexyl-butyldithiophosphate IUPAC: zinc bis[*O*-butyl-*O*-(2-ethylhexyl)phosphorodithioate] CAS RN: 26566-95-0
ZEPC	zinc ethylphenyldithiocarbamate IUPAC: zinc bis[ethyl(phenyl)dithiocarbamate] CAS RN: 14634-93-6
ZEX	zinc ethylxanthate IUPAC: zinc di-*O*-ethyl bis(dithiocarbonate) CAS RN: 13435-48-8

Table 1 (*continued*)

Abbreviated term	Common chemical name, IUPAC name and CAS RN (where available)
ZIX	zinc isopropylxanthate IUPAC: zinc di-*O*-isopropyl bis(dithiocarbonate) CAS RN: 1000-90-4
ZMBT	zinc 2-mercaptobenzothiazole IUPAC: zinc bis(1,3-benzothiazole-2-thiolate) CAS RN: 155-04-4
ZPMC	zinc pentamethylenedithiocarbamate IUPAC: zinc bis(piperidino-1-carbodithioate) CAS RN: 13878-54-1

4 Activators and process aids

Table 2 — Activators and process aids

Abbreviated term	Common chemical name, IUPAC name and CAS RN (where available)
DEA	diethanolamine IUPAC: 2,2'-iminodiethanol CAS RN: 111-42-2
DEG	diethylene glycol IUPAC: 2,2'-oxydiethanol CAS RN: 111-46-6
PEG	polyethylene glycol IUPAC: α-hydro-ω-hydroxypoly(oxyethylene) CAS RN: 25322-68-3
PPG	polypropylene glycol IUPAC: α-hydro-ω-hydroxypoly(oxypropylene) CAS RN: 25322-69-4
PVME	polyvinyl methyl ether IUPAC: poly(methoxyethylene) CAS RN: 9003-09-2
SPCP	sodium pentachlorophenate IUPAC: sodium pentachlorophenoxide CAS RN: 131-52-2
TEA	triethanolamine IUPAC: 2,2',2''-nitrilotriethanol CAS RN: 102-71-6
ZEH	zinc 2-ethylhexanoate; zinc octanoate IUPAC: zinc bis(2-ethylhexanoate) CAS RN: 136-53-8

5 Vulcanization retarders

Table 3 — Vulcanization retarders

Abbreviated term	Common chemical name, IUPAC name and CAS RN (where available)
CTP	*N*-cyclohexylthiophthalimide IUPAC: *N*-(cyclohexylthio)phthalimide CAS RN: 17796-82-6
HITM	hexaisopropylthiomelamine IUPAC: hexakis(isopropylthio)-1,3,5-triazine-2,4,6-triamine CAS RN: 86098-92-2
NDPA	*N*-nitrosodiphenylamine IUPAC: same CAS RN: 86-30-6

6 Antidegradants, antioxidants and antiozonants

6.1 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	*o*-	ortho
	p-	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	*tert*-butyl
	9	nonyl
	C	cyclohexyl

6.2 Abbreviated terms and names of antidegradants, antioxidants and antiozonants

Table 5 — Antidegradants, antioxidants and antiozonants

Abbreviated term	Common chemical name, IUPAC name and CAS RN (where available)
AANA	aldol-α-naphthylamine IUPAC: not possible CAS RN: not available
ADPA	acetone-diphenylamine condensate IUPAC: not possible CAS RN: 68412-48-6
APPD	*N*-alkyl-*N*′-phenyl-*p*-phenylenediamine IUPAC: not possible, generic name, not a single compound CAS RN: not available
p-BBp14	4,4'-butylidene-bis(6-*tert*-butyl-*m*-cresol) IUPAC: 6,6'-di-*tert*-butyl-4,4'-butylidenedi(*m*-cresol) CAS RN: 85-60-9
o-1BBp11	2,2'-isobutylidene-bis-(4,6-dimethylphenol) IUPAC: 2,2'-isobutylidene-4,4',6,6'-tetramethyldiphenol CAS RN: 33145-10-7
BHA	butyl hydroxyanisole IUPAC: a mixture of 2-*tert*-butyl-4-hydroxyanisole and 3-*tert*-butyl-4-hydroxyanisole CAS RN: 25013-16-5
BHT	2,6-di-*tert*-butyl-4-methylphenol; butylated hydroxytoluene IUPAC: 2,6-di-*tert*-butyl-*p*-cresol CAS RN: 128-37-0
CPPD	*N*-cyclohexyl-*N*′-phenyl-*p*-phenylenediamine IUPAC: same CAS RN: 101-87-1
DAHQ	2,5-di-*tert*-amylhydroquinone IUPAC: 2,5-di-*tert*-pentylhydroquinone CAS RN: 79-74-3
DBHQ	2,5-di-*tert*-butylhydroquinone IUPAC: same CAS RN: 88-58-4
DLTDP	dilauryl thiodipropionate IUPAC: didodecyl-3,3'-thiodipropionate CAS RN: 123-28-4
DMHPD	*N*,*N*′-bis(1-methylheptyl)-*p*-phenylenediamine IUPAC: same CAS RN: 103-96-8
DNPD	*N*,*N*′-di-2-naphthyl-*p*-phenylenediamine IUPAC: same CAS RN: 93-46-9
DPA	diphenylamine IUPAC: same CAS RN: 122-39-4
DPPD	*N*,*N*′-diphenyl-*p*-phenylenediamine IUPAC: same CAS RN: 74-31-7
DSTDP	distearyl thiodipropionate IUPAC: dioctadecyl-3,3'-thiodipropionate CAS RN: 693-36-7

Table 5 (*continued*)

Abbreviated term	Common chemical name, IUPAC name and CAS RN (where available)
DTPD	*N*,*N*′-ditolyl-*p*-phenylenediamine IUPAC: *N*,*N*′-di-*x*-tolyl-*p*-phenylenediamine, where *x* denotes *o*, *m*, *p* or mixture CAS RN: 27417-40-9
ETMQ	6-ethoxy-1,2-dihydro-2,2,4-trimethylquinoline IUPAC: same CAS RN: 91-53-2
p-IPBp(4)$_n$	polybutylated bisphenol A IUPAC: not possible CAS RN: 68784-69-0
IPDPA	*p*-isopropoxydiphenylamine IUPAC: 4-isopropoxy-*N*-phenylaniline CAS RN: 101-73-5
IPPD	*N*-isopropyl-*N*′-phenyl-*p*-phenylenediamine IUPAC: same CAS RN: 101-72-4
MBI	2-mercaptobenzimidazole IUPAC: benzimidazole-2-thiol CAS RN: 583-39-1
o-MBp1C	2,2'-methylene-bis(4-methyl-6-cyclohexylphenol) IUPAC: 6,6'-dicyclohexyl-2,2'-methylenedi(*p*-cresol) CAS RN: 4066-02-8
o-MBp1(1C)	2,2'-methylene-bis[6-(1-methyl cyclohexyl)-*p*-cresol] IUPAC: 6,6'-bis(1-methylcyclohexyl)-2,2'-methylenedi(*p*-cresol) CAS RN: 77-62-3
o-MBp14	2,2'-methylene-bis(4-methyl-6-*tert*-butylphenol) IUPAC: 6,6'-di-*tert*-butyl-2,2'-methylenedi(*p*-cresol) CAS RN: 119-47-1
o-MBp19	2,2'-methylene-bis(4-methyl-6-nonylphenol) IUPAC: 6,6'-dinonyl-2,2'-methylenedi(*p*-cresol) CAS RN: 7786-17-6
o-MBp24	2,2'-methylene-bis(4-ethyl-6-*tert*-butylphenol) IUPAC: 6,6'-di-*tert*-butyl-4,4'-diethyl-2,2'-methylenediphenol CAS RN: 88-24-4
p-MBp44	4,4'-methylene-bis(2,6-di-*tert*-butylphenol) IUPAC: 2,2',6,6'-tetra-*tert*-butyl-4,4'-methylenediphenol CAS RN: 118-82-1
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)
NDIBC	nickel dibutyldithiocarbamate IUPAC: nickel bis(dibutyldithiocarbamate) CAS RN: 13927-77-0
NDINC	nickel diisononyldithiocarbamate IUPAC: bis-(*N*,*N*-diisononylcarbamodithioato-κS,κS')-nickel CAS RN: 85604-95-5, 85298-61-9
NDMC	nickel dimethyldithiocarbamate IUPAC: bis-(*N*,*N*-dimethylcarbamodithioato-κS,κS')-nickel-(SP-4-1) CAS RN: 15521-65-0

Table 5 (*continued*)

Abbreviated term	Common chemical name, IUPAC name and CAS RN (where available)
ODPA	octylated diphenylamine IUPAC: not possible CAS RN: 101-67-7; 68411-46-1
PAN	*N*-phenyl-α-naphthylamine IUPAC: *N*-(1-naphthyl)aniline CAS RN: 90-30-2
PBN	*N*-phenyl-β-naphthylamine IUPAC: *N*-(2-naphthyl)aniline CAS RN: 135-88-6
SDPA	styrenated diphenylamine IUPAC: not possible CAS RN: 68442-68-2
SPH	styrenated phenol IUPAC: not possible CAS RN: 61788-44-1
p-TBp14	4,4'-thio-bis(2-*tert*-butyl-*m*-cresol) IUPAC: 2,2'-di-*tert*-butyl-4,4'-thiodi(*m*-cresol) CAS RN: 96-69-5
TMQ	polymerized 2,2,4-trimethyl-1,2-dihydroquinoline IUPAC: not possible CAS RN: 26780-96-1
TNPP	tri(nonylphenyl) phosphite IUPAC: tris(*x*-nonylphenyl) phosphite, where *x* denotes *o*, *m*, *p* or mixture CAS RN: 26523-78-4
ZMBI	zinc 2-mercaptobenzimidazole IUPAC: zinc bis(benzimidazole-2-thiolate) CAS RN: 3030-80-6
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
6PPD	*N*-1,3-dimethylbutyl-*N*′-phenyl-*p*-phenylenediamine IUPAC: same CAS RN: 793-24-8
7PPD	*N*-1,4-dimethylpentyl-*N*′-phenyl-*p*-phenylenediamine IUPAC: same CAS RN: 3081-01-4
77PD	*N*,*N*′-bis(1,4-dimethylpentyl)-*p*-phenylenediamine IUPAC: same CAS RN: 3081-14-9
8HPPD	*N*-ethylhexyl-*N*′-phenyl-*p*-phenylenediamine IUPAC: *N*-(2-ethylhexyl)-*N*′-phenyl-*p*-phenylenediamine CAS RN: 82209-88-9
8PPD	*N*-octyl-*N*′-phenyl-*p*-phenylenediamine IUPAC: *N*-(1-methylheptyl)-*N*′-phenyl-*p*-phenylenediamine CAS RN: 15233-47-3
88PD	*N*,*N*′-dioctyl-*p*-phenylenediamine IUPAC: *N*,*N*′-bis(1-ethyl-3-methylpentyl)-*p*-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.

7 Plasticizers and softeners

7.1 Naming conventions

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

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

7.1.3 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 International Standard. Because of this dual usage, the application of the convention specified in 7.1.2 is most important.

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

7.1.5 Mixtures of plasticizers are not considered in this International Standard.

7.1.6 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.

7.2 Abbreviated terms and names of plasticizers and softeners

Table 6 — Plasticizers and softeners

Abbreviated term	Common chemical name, IUPAC name and CAS RN (where available)
BBP	benzyl butyl phthalate IUPAC: same CAS RN: 85-68-7
BOA	benzyl octyl adipate IUPAC: benzyl 2-ethylhexyl adipate CAS RN: 3089-55-2
BOP	butyl octyl phthalate IUPAC: butyl 2-ethylhexyl phthalate CAS RN: 85-69-8
DBP	dibutyl phthalate IUPAC: same CAS RN: 84-74-2
DBS	dibutyl sebacate IUPAC: same CAS RN: 109-43-3
DEP	diethyl phthalate IUPAC: same CAS RN: 84-66-2
DIBA	diisobutyl adipate IUPAC: same CAS RN: 141-04-8
DIBP	diisobutyl phthalate IUPAC: same CAS RN: 84-69-5