

The subject-matter with which this heading is primarily concerned is:  
. compositions characterized by the choice of two or more polymers which are mixed together  
. methods of making mixtures of polymers

#### Definition

The term “polymer” as used herein includes bitumens, tars, waxes, fats, modified fats, fatty oils, modified fatty oils, natural resins and prepolymers

#### Explanation of heading subject matter and relationships with other headings

Within the above statement of subject matter, the scope of this heading extends to documents that would be found in headings C3E, Indiarubber &c, C3F, Cellulose &c compositions, C3G, Graft polymers, C3P, Addition polymers &c, C3Q, Indiarubber &c compositions, and C3R, Condensation polymers &c, as defined in the 1400 Key. It is effectively complete for its nominal subject matter and very few polymer blends characterized by the choice of two or more polymers which are mixed together or methods of making such blends remain outside its scope; those that do are to be found principally in headings C3B, Epoxy resins, C3H, Proteins, enzymes and nucleic acids, C3T, Organo-silicon polymers, and C3U, Polysaccharides &c, and search in such headings should be considered when appropriate

#### Polymer mixtures:

Most of the subject-matter of this heading relates to compositions wherein the properties of the final mixture depend on the nature and amount of each polymer present. However, significant disclosure relating to the choice of one or more polymers to be incorporated in a polymer or polymer mixture as an additive in a purely perfecting role without changing the basic nature of the composition, *e.g.* as an antistatic agent, is also subject-matter for this heading. If the polymer additive is a plasticizer, tackifier or waterproofer or fulfils a function for which no specific provision is made in heading C3K, Polymer &c additives such disclosures are classified only here and are not repeated in C3K but polymeric additives for other functions for which there is specific provision in C3K are repeated in C3K

Polymer compositions including polymer mixtures which have as an essential ingredient a non-polymeric fire-retardant, fire-resistant or intumescent additive or a non-polymeric compound or mixture of compounds which will form a bond with another material are however classified only in C3K and not found in C3M

Compositional subject-matter which does not readily fall into the categories covered by headings C3K and C3M is to be found in heading C3V, Miscellaneous polymer compositions, articles and uses. It should however be noted that C3M includes mixtures in solution or dispersion and also compositions which contain other materials such as plasticizers or fillers that are conventional additives about which there is no other significant information. It follows that a complete search for disclosures concerned with the combination of polymer mixtures and non-polymeric additives requires search in C3M and C3V, and, for certain categories of composition referred to above, in C3K also

#### Excluded are:

- . electrophotographic developers and toners—G2C, Photographic radiation sensitive materials and their processing
- . cellular and porous products—C3C, Cellular polymeric materials
- . coated, laminate and other structured composite materials not characterized by the choice of polymer blend—heading for the materials, *eg* B2E, Coated products; B5N, Laminated products

#### Methods of making mixtures of polymers:

Classified here are methods of making mixtures of polymers characterized by the choice of polymers. Methods of making mixtures of polymers characterized by the procedural steps employed are to be found in C3L, Polymer &c working up. If the polymer mixture blend is novel *per se*, only the polymer mixture is classified and significant information about the method of making the polymer mixture is recorded by indexing. A full search for the subject of methods of preparation of polymer mixtures will therefore necessitate search under the relevant classifying and indexing provisions of this heading and further search in heading C3L

The exclusion references listed in this heading are not exhaustive. Reference should be made to the appropriate general heading/s for processes, materials, elements or devices which may be more widely applicable than can appropriately be classified in this heading

#### Relationship with the Universal Indexing Schedules (heading U1S)

In addition to recording uses and applications of inventions classified in this heading, U1S is used, subject to its indexing rules, to record significant properties of materials with which this heading is concerned

Operative dates for Key entries

The operative dates of the terms in this heading are:

1. for all terms annotated by a marginal code, that of the Edition corresponding to that code
2. for all other terms, earlier than that of Edition A

Classifying, indexing and searching note

Indexing Schedule 1 is used only to index those disclosures for which there are clear and unambiguous directions, for example in a worked Example. In searching and subject to the following proviso, any number of indexing terms may be combined with or without a classifying term. One indexing term M300, marked with an asterisk\* is however only assigned for disclosure of a method of preparing a polymer mixture which method is novel in its own right or described in sufficient detail to constitute useful search material *per se*, the disclosure having been classified primarily as a polymer mixture

Indexing Schedule 2 is used only with classifying term MXC; all applicable indexing terms from Schedule 2 are applied

Classifying Schedule

- |    |   |  |
|----|---|--|
| MA | polymer mixtures cross-referenced from C3K solely because the additive which is the subject of the invention is polymeric in nature   |  |
| MB | polymer mixtures characterized in that one or more of the polymers therein is a plasticizer for the remaining polymer(s)  |  |
| MC | polymer mixtures which are not substantially homogeneous; mixtures comprising polymer particles in a polymer matrix which have not been classified in C3K as mixtures characterised by choice of filler ( <i>including</i> compositions of polymers which are not essentially incompatible but are present in such a form that they do not mix homogeneously, <i>e.g.</i> in a liquid which dissolves one polymer but not the other)  |  |
| MD | mixtures comprising two or more rubbery polymers<br><i>Note: liquid polybutadiene is not a rubbery polymer</i>  |  |
| ME | mixtures of two or more polymers as the only polymers present where the polymers are chemically substantially identical but differ by physical properties only<br>mutually cross-linking mixtures of polymers—<br><i>Note: classified here are polymer mixtures where the cross-linking does not occur by means of a clear-cut chemical reaction. Reaction between for example a polycarboxyl polymer and a polyhydroxyl polymer is more likely to be found under the appropriate chemical after-treatment term in heading C3J, Polymers &amp;c, chemical after-treatment</i> |  |
| h  | MFC   | . casting and moulding compositions<br>. coating, adhesive and like compositions with liquid vehicle—<br>. . . aqueous or aqueous/organic vehicle—<br>. . . containing an aminoplast, phenoplast, epoxy resin or isocyanate resin cross-linking agent—       |
| h  | MFWA  | . . . . characterized by such cross-linking agent  |
| h  | MFWB  | . . . . characterized by other polymeric component   |
| h  | MFWC  | . . . . characterized by catalyst  |
| h  | MFWD  | . . . . characterized by non-polymeric reactive diluent  |
| h  | MFWX  | . . . . characterized in other ways  |
| h  | MFWY  | . . . containing a polymeric cross-linking agent <i>other than</i> aminoplast, phenoplast, epoxy resin or isocyanate resin<br>. . . non-aqueous vehicle—<br>. . . containing an aminoplast, phenoplast, epoxy resin or isocyanate resin cross-linking agent— |
| h  | MFNA  | . . . . characterized by such cross-linking agent  |
| h  | MFNB  | . . . . characterized by other polymeric component   |
| h  | MFNC  | . . . . characterized by catalyst  |
| h  | MFND  | . . . . characterized by non-polymeric reactive diluent  |
| h  | MFNX  | . . . . characterized in other ways  |
| h  | MFNY  | . . . containing a polymeric cross-linking agent <i>other than</i> aminoplast, phenoplast, epoxy resin or isocyanate resin   |

Classifying Schedule—*cont*

h	MFL	. other liquid compositions . solid compositions, <i>other than</i> casting or moulding compositions—
h	MFP	. . in powder, granule or like particulate form
h	MFS	. . other
h	MFZ	. other compositions; disclosures of compositions falling within more than one of terms MFC to MFS <i>above</i>
		other mixtures—
		. adhesive, coating, impregnating, sealing and like compositions only—
		. . normally liquid compositions—
h	MXAW	. . . aqueous or aqueous/organic vehicle
h	MXAN	. . . non aqueous vehicle ( <i>including</i> organosols)
h	MXAL	. . . other liquid compositions ( <i>including</i> polymerizable, heat convertible, plastisol)
		. . normally solid compositions—
h	MXAP	. . . in powder, granule or like particulate form
h	MXAH	. . . hot melt compositions
h	MXAS	. . . other normally solid compositions
h	MXAT	. . compositions intermediate the solid and liquid states ( <i>eg</i> tacky, pressure sensitive, mastic, gel)
h	MXAM	. . disclosures of compositions falling within more than one of terms MXAW to MXAT <i>above</i>
a	MXC	. casting, moulding and like compositions only . . <i>See also</i> Indexing Schedule 2
a	MXX	. composition having only other types of use, <i>e.g.</i> flocculating agents, metal working lubricants, oil additives, scale inhibitors and soil conditioners
a	MXZ	. disclosures of compositions falling within both terms MXC and MXX; or within at least one of terms MXC and MXX and at least one of MXAW to MXAM
	ML	methods of preparing polymer mixtures

Indexing Schedule 1

For indexing purposes polymers are notionally grouped into four categories viz: block polymers, graft polymers, other chemically modified polymers and “simple” polymers, this last group covering homopolymers and copolymers whether alternating or random. The indexing provisions consist of (a) a list of polymer types defined in the main by reference to the polymerizing monomer(s) or to the linking group (for certain condensation polymers) but with a small number defined by reference to functional groups pendant to the polymer chain, and (b) a list of suffixes for identifying block, graft or modified character where necessary

A simple polymer receives only the code of the indexing term that most specifically describes it. A block polymer receives a plurality of codes, each with the suffix A identifying block polymer character, corresponding to the terms which severally most specifically describe the identifiable segments in the polymer. A graft polymer receives *either* the code of the indexing term which most specifically describes it as a whole, where this exists, *e.g.* M148 for acrylonitrile-butadiene-styrene graft copolymer *or* the code of the term which most specifically describes the polymer of the grafting monomer(s) together with the suffix B and the code of the term which most specifically describes the polymer backbone together with the suffix D

A modified polymer receives *either* the code of the term specific for it, where this exists, *e.g.* M122 for polyvinyl alcohol and partially hydrolysed polyvinyl acetates and M126 for polyvinyl acetals, *or* the code for the term which most clearly describes the unmodified polymer with the suffix C for modified polymer

A code may receive more than one suffix, *e.g.* M143AC denotes a chemically modified ethylene- $\alpha$ -olefin block copolymer, the combined suffixes being written in alphabetical order

The list of polymer types has been so arranged that for most polymers the most specifically descriptive term will be encountered first but care is required that the selected term is in fact the most specific. For example term M121 (polymers containing pendant amide groups) is fairly specific for polyvinyl pyrrolidone but is not so specific as term M151 (polymers of ethylenically unsaturated pyrrolidone). Consequently M151 (although later occurring) and *not* M121 is assigned for this polymer

Where a copolymer contains pendant functional groups of more than one type and the most specific description of the copolymer would be provided by a combination of the corresponding terms, all such terms are assigned

Indexing Schedule 1—*cont*

The following are not regarded as functional groups: halogen, ester, nitrile and ether

The terms “styrene” and “polystyrene” include the corresponding alkyl- and halogen-substituted compounds

*Polymers*

M100	polyoxymethylenes
M101	polyurethanes
M102	polyarylene polyethers, polysulphones
M103	silicone polymers
M104	nylons
M105	polyimides
M106	other polyamides <i>including</i> polyester amides
M107	polycarbonates
M108	linear fibre-forming polyesters
M109	polyesters containing ethylenic unsaturation
M110	other polyesters
M111	polysulphides
M112	polyethers, phenoxy resins ( <i>i.e.</i> equimolar epihalohydrin/bisphenol condensates)
M113	polyamines and polyimines
M114	epoxy resins
M115	phenol-aldehyde resins
M116	aminoplasts
M117	other condensation polymers <i>including</i> furfuryl alcohol and furfural resins
M118	carboxylic rubbers
M119	ethylene-carboxylic acid copolymers, salts thereof, “ionomers”, ethylene-CO copolymer
M120	other polymers containing carboxylic acid or anhydride groups; salts thereof
M121	polymers containing amide groups pendant from the polymer chain
M122	polyvinyl alcohol and partially hydrolysed polyvinyl acetates
M123	other polymers containing hydroxyl groups
M124	polymers containing amino groups <i>other than</i> quaternary ammonium groups
M125	polymers containing other functional groups
M126	polyvinyl acetals
M127	polybutadiene
M128	natural polyisoprene
M129	synthetic polyisoprene
M130	chloroprene polymers
M131	butyl rubber
M132	polyisobutylene
M133	styrene diene rubber
M134	nitrile and like rubbers
M135	coumarone-indene resins, terpene resins, petroleum resins, styrene-modified resins
M136	polyvinyl acetate
M137	polymers of ethylenically unsaturated aldehydes and ketones
M138	polymers of ethylenically unsaturated ethers
M139	polyethylene
M140	polypropylene
M141	polybutene—1
M169	homopolymers of higher $\alpha$ -olefins
M142	ethylene- $\alpha$ -olefin-diene copolymers
M143	ethylene- $\alpha$ -olefin copolymer
M144	ethylene-vinyl acetate copolymer
M170	other $\alpha$ -olefin-based copolymers
M145	polymethyl methacrylate
M146	polystyrene; high impact polystyrene
M147	(meth) acrylate-diene-styrene polymers

Indexing Schedule 1—*cont*

M148	acrylonitrile-butadiene-styrene copolymers
M149	styrene-acrylonitrile copolymers
M150	polymers of ethylenically unsaturated pyridines
M151	polymers of ethylenically unsaturated pyrrolidones
M152	other styrene-based copolymers
M153	other (meth) acrylate polymers
M154	other nitrile-containing polymers
M155	polyvinyl chloride
M156	vinyl chloride-vinyl acetate copolymers
M157	vinylidene chloride polymers
M158	other vinyl chloride-based copolymers
M159	tetrafluoroethylene-containing polymers
M171	other fluorine-containing polymers
M160	other polymers based on ethylenic monomers
M161	nitrocellulose
M162	cellulose ethers
M163	other cellulose polymers, starch and other non-cellulosic polysaccharides
M164	other polymers, <i>e.g.</i> proteins, complex resins prepared by concomitant addition and condensation reactions
M165	waxes
M166	bitumen, tar, pitch, asphalt
M167	fats, modified fats, fatty oils, modified fatty oils
M168	natural resins, derivatives thereof

*suffixes denoting polymers that are not "simple" polymers*

A	block polymers
B	graft side-chain
C	chemically after-treated
D	graft backbone

*other indexing terms*

M200	composition dissolved or dispersed in water
M201	composition dissolved or dispersed in other liquid vehicle
M202	composition containing fibrous filler or reinforcement
M203	composition used as an adhesive
* M300	method of preparing composition

Indexing Schedule 2

*Terms from this schedule are applicable only with classifying term MXC*

p	MX1A	for use in unsupported film, fibres, textiles and sheet materials
p	MX1B	for use in bearings, wear resistant or friction materials
p	MX1C	for use in extrusion coating, casting, low-temperature moulding
p	MX1D	for use in sound absorbing and vibration damping
p	MX1H	for use in electrical applications, antistatic and conductive compositions
p	MX1L	for use in sports equipment, games or toys
p	MX1M	for use in medical applications
p	MX1N	for use in optical applications, or characterised by optical properties <i>including</i> gloss, transparency, refractive index or the like
p	MX1R	for use in tyres, belts, spiral wound hoses and like reinforced articles
p	MX1E	characterised by the composition being a thermoplastic elastomer
p	MX1F	characterised by the presence of a polymeric flame retardant . non polymeric fire retardant additives— <i>See</i> C3K, Polymer &c additives
p	MX1J	characterised by impact, crack, flexural, tensile or like properties, or by dimensional stability
p	MX1P	characterised by processability
p	MX1S	characterised by oil, solvent, hydrolysis or chemical resistance, gas or vapour barrier properties, or water absorbency
p	MX1X	other compositions