

Nucleated polyoxymethylene molding compositions

The invention relates to thermoplastic molding compositions
5 comprising

- A) from 20 to 99.9% by weight of a polyoxymethylene homo- or copolymer,
- 10 B) from 0.0001 to 1.0% by weight of a nucleating agent which differs from C),
- C) from 0.001 to 5% by weight of a melamine-formaldehyde condensate, and
- 15 D) from 0 to 70% by weight of other additives,

where the sum of the percentages by weight of components A) to D) is always 100%.

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The invention also relates to the use of the novel molding compositions for producing moldings, and to the resultant moldings.

25 It is known from DE-A 25 40 207 that melamine-formaldehyde condensates can be used in combination with antioxidants to improve the thermal stability and nucleation of POM molding compositions.

30 It is also known from DE-A 12 47 645 and DE-A 19 40 132 that talc can be incorporated into POM as a nucleating agent in order to control the size of the POM spherulites. The result is an improvement of and an increase in the uniformity of the crystal structure of the moldings.

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The known molding compositions have disadvantages in processing speed, e.g. in injection molding (the polyoxymethylene has little inclination to crystallize).

40 It is an object of the present invention to increase the crystallization rate of POM molding compositions in such a way that these can be processed more readily and more rapidly by the various methods of processing (e.g. injection molding).

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We have found that this object is achieved by means of the molding compositions defined at the outset. Preferred embodiments are given in the subclaims.

5 The novel molding compositions comprise, as component A), from 20 to 99% by weight, preferably from 30 to 98% by weight and in particular from 50 to 98% by weight, of a polyoxymethylene homo- or copolymer.

10 Such polymers are known to the person skilled in the art and are described in the literature.

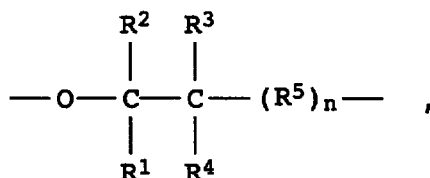
Very generally, these polymers have at least 50 mol% of recurring units $\text{-CH}_2\text{O-}$ in their main polymer chain.

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The homopolymers are generally prepared by polymerizing formaldehyde or trioxane, preferably in the presence of suitable catalysts.

20 For the purposes of the invention, polyoxymethylene copolymers are preferred as component A, especially those which, besides the recurring units $\text{-CH}_2\text{O-}$, also have up to 50 mol%, preferably from 0.1 to 20 mol%, in particular from 0.3 to 10 mol% and very particularly preferably from 2 to 6 mol%, of recurring units

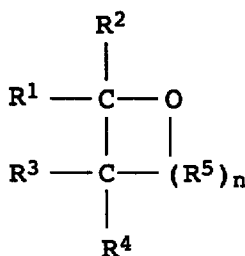
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where R^1 to R^4 , independently of one another, are hydrogen, C_1 - C_4 -alkyl or halo-substituted alkyl having from 1 to 4 carbon
 35 atoms, and R^5 is $\text{-CH}_2\text{-}$, $\text{-CH}_2\text{O-}$ or C_1 - C_4 -alkyl- or C_1 - C_4 -haloalkyl-substituted methylene, or is a corresponding oxymethylene group and n is in the range from 0 to 3. These groups may advantageously be introduced into the copolymers by ring-opening
 40 cyclic ethers. Preferred cyclic ethers are those of the formula

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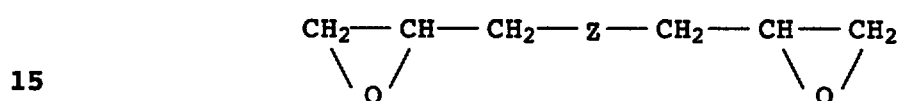


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where R^1 to R^5 and n are as defined above. Merely as examples, mention may be made of ethylene oxide, 1,2-propylene oxide, 1,2-butylene oxide, 1,3-butylene oxide, 1,3-dioxane, 1,3-dioxolane and 1,3-dioxepan as cyclic ethers, and also, as
 5 comonomers, linear oligo- or polyformals, such as polydioxolane or polydioxepan.

Other suitable components A) are oxymethylene terpolymers, which are prepared, for example, by reacting trioxane and one of the
 10 cyclic ethers described above with a third monomer, preferably bifunctional compounds of the formula



and/or



where Z is a chemical bond, $-O-$ or $-ORO-$ ($R = C_1-C_8$ -alkylene or C_2-C_8 -cycloalkylene).

25 Preferred monomers of this type are ethylene diglycide, diglycidyl ethers and diethers made from glycidyls and formaldehyde, dioxane or trioxane in a molar ratio of 2:1, and also diethers made from 2 mol of glycidyl compound and 1 mol of an aliphatic diol having from 2 to 8 carbon atoms, such as the
 30 diglycidyl ethers of ethylene glycol, 1,4-butanediol, 1,3-butanediol, 1,3-cyclobutanediol, 1,2-propanediol and 1,4-cyclohexanediol, to mention only a few examples.

Processes for preparing the homo- and copolymers described above
 35 are known to the person skilled in the art and are described in the literature, so that no further details are necessary here.

The preferred polyoxymethylene copolymers have melting points of at least 150°C and molecular weights (weight-average) M_w in the
 40 range from 5000 to 200,000, preferably from 7000 to 150,000.

Particular preference is given to end-group-stabilized polyoxymethylenepolymers which have C-C bonds at their chain ends.

The novel molding compositions comprise, as component B), from 0.0001 to 1% by weight, preferably from 0.001 to 0.8% by weight and in particular from 0.01 to 0.3% by weight, of a nucleating agent which differs from C).

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Possible nucleating agents are all of the known compounds, for example melamine cyanurate, boron compounds, such as boron nitride, silica, pigments, such as Heliogen Blue® (copper phthalocyanine pigment; registered trademark of BASF

10 Aktiengesellschaft) or branched polyoxymethylenes, which in these small amounts have a nucleating effect.

Talc is a particular nucleating agent used, and is a hydrated magnesium silicate of the formula $Mg_3[(OH)_2/Si_4O_{10}]$ or $3 MgO \cdot$

15 $4 SiO_2 \cdot H_2O$. These three-layer phyllosilicates have a triclinic, monoclinic or rhombic crystal structure and lamellar appearance. Other trace elements which may be present are Mn, Ti, Cr, Ni, Na and K, and the OH group may be replaced to some extent by fluoride.

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It is particularly preferable to use a talc 100% of whose particle sizes are $< 20 \mu m$. The particle size distribution is usually determined by sedimentation analysis and is preferably:

25	$< 20 \mu m$	100% by weight
	$< 10 \mu m$	99% by weight
	$< 5 \mu m$	85% by weight
	$< 3 \mu m$	60% by weight
	$< 2 \mu m$	43% by weight

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Such products are obtainable commercially as Micro-Talc I.T. extra (Norwegian Talc Minerals).

The novel molding compositions comprise, as component C), from 35 0.001 to 5% by weight, preferably from 0.01 to 3% by weight and in particular from 0.05 to 1% by weight, of a melamine-formaldehyde condensate. This is preferably a precipitation condensate in finely divided form, which is crosslinked and water-insoluble. The molar ratio of formaldehyde to melamine is 40 preferably from 1.2:1 to 10:1, in particular from 1.2:1 to 2:1. DE-A 25 40 207 gives the structure of such condensates and processes for their preparation.

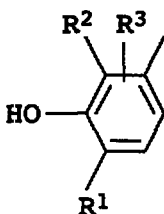
The novel molding compositions may comprise, as component D), 45 from 0 to 70% by weight, preferably from 0 to 50% by weight and in particular from 0 to 40% by weight, of other additives.

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Suitable sterically hindered phenols D1) are in principle any compound with phenolic structure which has at least one bulky group on the phenolic ring.

5 Examples of preferred compounds are those of the formula

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where:

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R^1 and R^2 are an alkyl, substituted alkyl or substituted triazole group, where R^1 and R^2 may be identical or different, and R^3 alkyl, substituted alkyl, alkoxy or substituted amino.

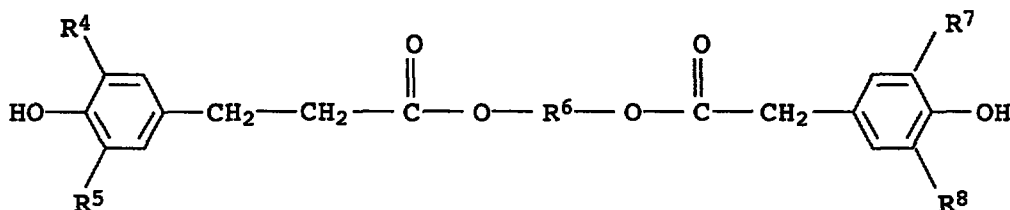
20 Antioxidants of the type mentioned are described, for example, in DE-A 27 02 661 (US-A 4 360 617).

Another group of preferred sterically hindered phenols is that derived from substituted benzene carboxylic [sic] acids, in

25 particular from substituted benzene propionic [sic] acids.

Particularly preferred compounds from this class are those of the formula

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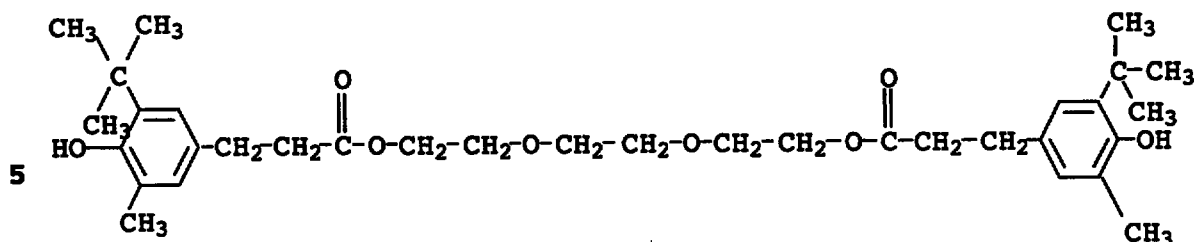
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where R^4 , R^5 , R^7 and R^8 , independently of one another, are C_1 - C_8 -alkyl, which themselves may be substituted (and at least one of them is a bulky group) and R^6 is a bivalent aliphatic radical having from 1 to 10 carbon atoms, which may also have C-O bonds

40 in its main chain.

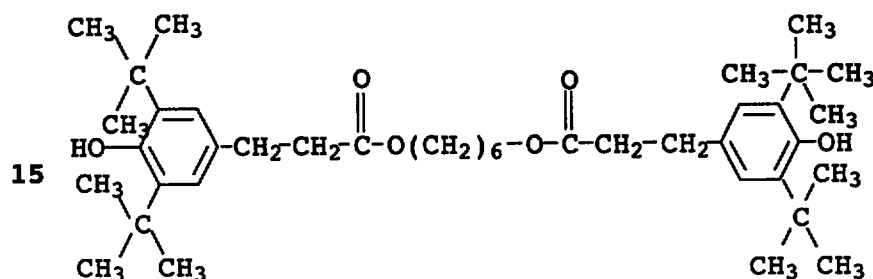
Preferred compounds of this forms [sic] are

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(Irganox® 245 from Ciba-Geigy)

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(Irganox® 259 from Ciba-Geigy)

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Further examples of sterically hindered phenols are:

- 2,2'-methylenebis(4-methyl-6-tert-butylphenol), 1,6-hexanediol
bis[3-(3,5-di-tert-butyl-4-hydroxyphenyl)propionate],
25 pentaerythritol tetrakis[3-(3,5-di-tert-butyl-4-hydroxyphenyl)-
propionate], distaryl [sic] 3,5-di-tert-butyl-4-hydroxybenzyl-
phosphonate, 2,6,7-trioxa-1-phosphabicyclo[2.2.2]-oct-4-ylmethyl
3,5-di-tert-butyl-4-hydroxyhydrocinnamate, 3,5-di-tert-butyl-
4-hydroxyphenyl-3,5-distearylthiotriazylamine, 2-(2'-hydroxy-
30 3'-hydroxy-3',5'-di-tert-butylphenyl)-5-chlorobenzotriazole,
2,6-di-tert-butyl-4-hydroxymethylphenol, 1,3,5-trimethyl-
2,4,6-tris(3,5-di-tert-butyl-4-hydroxybenzyl)benzene,
4,4'-methylenebis(2,6-di-tert-butylphenol), 3,5-di-tert-
butyl-4-hydroxybenzyl dimethylamine and N,N'-hexamethylenebis-
35 3,5-di-tert-butyl-4-hydroxyhydrocinnamide.

Those which have proven particularly effective and are therefore preferably used are 2,2'-methylenebis(4-methyl-6-tert-butylphenyl) [sic], 1,6-hexanediol

- 40 bis(3,5-di-tert-butyl-4-hydroxyphenyl)propionate (Irganox® 259),
pentaerythritol tetrakis[3-(3,5-di-tert-butyl-4-hydroxyphenyl)propionate] and the Irganox® 245 from Ciba Geigy described above, which is particularly suitable.

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The antioxidants (D1) may be used individually or as mixtures in amounts of up to 2% by weight, preferably from 0.1 to 1.0% by weight, based on the total weight of the molding compositions A) to D).

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Sterically hindered phenols which have proven particularly advantageous in some cases, in particular in assessments of colorfastness on storage in diffuse light over prolonged periods, are those with not more than one sterically hindered group in
10 ortho position to the phenolic hydroxyl group.

The polyamides which may be used as components D2) are known per se. Use may be made of semi-crystalline or amorphous resins, as described, for example, in the Encyclopedia of Polymer Science
15 and Engineering, Vol. 11, John Wiley & Sons, Inc., 1988, pp. 315 - 489. The melting point of the polyamide is preferably less than 225°C, particularly preferably less than 215°C.

Examples of these are polyhexamethyleneazelaamide, polyhexa-
20 methylenesebacamide, polyhexamethylenedodecanediamide, poly-11-aminoundecamide and bis(p-aminocyclohexyl)methanedodecanediamide, or the products obtained by ring-opening of lactams, for example or [sic] polylaurolactam. Other suitable polyamides are those based on terephthalic acid or on isophthalic acid as acid
25 component and/or trimethylhexamethylenediamine or bis(p-aminocyclohexyl)propane as diamine component, and also polyamide base resins which have been prepared by copolymerizing two or more of the abovementioned polymers or components of these.

30 Particularly suitable polyamides which may be mentioned are copolyamides based on caprolactam, hexamethylenediamine, p,p'-diaminodicyclohexylmethane and adipic acid. An example of these is the product marketed under the designation Ultramid® 1 C by BASF Aktiengesellschaft.

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Other suitable polyamides are marketed by Du Pont under the designation Elvamide®.

The preparation of these polyamides is likewise described in the
40 abovementioned text. The ratio of terminal amino groups to terminal acid groups can be controlled by varying the molar ratio of the starting compounds.

The proportion of the polyamide in the novel molding composition
45 is up to 2% by weight, preferably from 0.005 to 1.99% by weight, particularly preferably from 0.1 to 1.5% by weight.

The dispersibility of the polyamides used can be improved in some cases by concomitant use of a polycondensation product made from 2,2-di(4-hydroxyphenyl)propane (bisphenol A) and epichlorohydrin.

- 5 Such condensation products made from epichlorohydrin and bisphenol A are commercially available. Processes for their preparation are also known to the person skilled in the art. Tradenames of the polycondensates are Phenoxy® (from Union Carbide Corporation) and Epikote® (Shell). The molecular weight
10 of the polycondensates can vary within wide limits. The grades obtainable commercially are in principle all suitable.

- Examples of the reinforcing fillers, which differ from B) and C) and are present in amounts of up to 50% by weight, preferably up
15 to 40% by weight, are potassium titanate whiskers, carbon fibers and preferably glass fibers. The glass fibers may be used, for example, in the form of glass wovens, glass mats, glass nonwovens and/or glass filament rovings or chopped glass filaments made from low-alkali E glass with a diameter of from 5 to 200 µm,
20 preferably from 8 to 50 µm. After their incorporation the fibrous fillers preferably have an average length of from 0.05 to 1 µm, in particular from 0.1 to 0.5 µm.

- Examples of other suitable fillers are calcium carbonate and
25 glass beads, and mixtures of these fillers.

- Other additives which may be mentioned are amounts of up to 50% by weight, preferably from 0 to 40% by weight, of impact-modifying polymers (also termed elastomeric polymers or
30 elastomers below).

Preferred types of such elastomers are ethylene-propylene (EPM) rubbers and ethylene-propylene-diene (EPDM) rubbers.

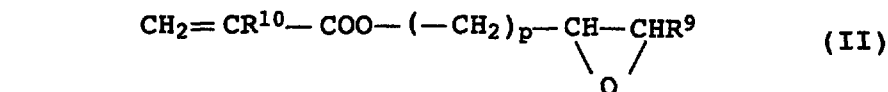
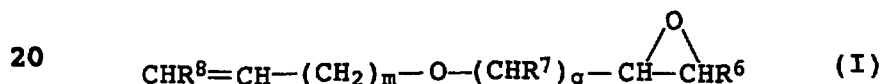
- 35 EPM rubbers generally have almost no residual double bonds, whereas EPDM rubbers have from 1 to 20 double bonds per 100 carbon atoms.

- Examples which may be mentioned of diene monomers for EPDM
40 rubbers are conjugated dienes, such as isoprene and butadiene, nonconjugated dienes having from 5 to 25 carbon atoms, such as 1,4-pentadiene, 1,4-hexadiene, 1,5-hexadiene, 2,5-dimethyl-1,5-hexadiene and 1,4-octadiene, cyclic dienes, such as cyclopentadiene, cyclohexadiene, cyclooctadiene and
45 dicyclopentadiene, and also alkenylnorbornenes, such as 5-ethylidene-2-norbornene, 5-butyldiene-2-norbornene, 2-methallyl-5-norbornene and 2-isopropenyl-5-norbornene, and

tricyclodienes, such as 3-methyltricyclo(5.2.1.0.2.6)-3,8-decadiene [sic] or mixtures of these. Preference is given to 1,5-hexadiene-5-ethylidenenorbornene [sic] and dicyclopentadiene. The diene content of the EPDM rubbers is preferably from 0.5 to 50% by weight, in particular from 1 to 8% by weight, based on the total weight of the rubber.

The EPDM rubbers may also have been grafted with other monomers, e.g. with glycidyl (meth)acrylates, other (meth)acrylates and (meth)acrylamides.

Copolymers of ethylene with (meth)acrylates are another class of preferred rubbers. The rubbers may also comprise monomers containing epoxy groups. These monomers containing epoxy groups are preferably incorporated into the rubber by adding to the monomer mixture monomers which contain epoxy groups and have the formula I or II



where R^6 to R^{10} are hydrogen or alkyl having from 1 to 6 carbon atoms, and m is an integer from 0 to 20, g is an integer from 0 to 10 and p is an integer from 0 to 5.

R^6 to R^8 are preferably hydrogen, where m is 0 or 1 and g is 1. The corresponding compounds are allyl glycidyl ether and vinyl glycidyl ether.

Preferred compounds of the formula II are acrylates and/or methacrylates which in both cases contain epoxy groups, for example glycidyl acrylate and glycidyl methacrylate.

The copolymers are advantageously composed of from 50 to 98% by weight of ethylene and from 0 to 20% by weight of monomers containing epoxy groups, the remaining amount being (meth)acrylates.

Particular preference is given to copolymers made from

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from 50 to 98% by weight, in particular from 55 to 95% by weight of ethylene, in particular from 0.3 to 20% by weight of glycidyl acrylate and/or

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from 0 to 40% by weight, in particular from 0.1 to 20% by weight, of glycidyl methacrylate, and

10 from 1 to 50% by weight, in particular from 10 to 40% by weight, of n-butyl acrylate and/or 2-ethylhexyl acrylate.

Other preferred (meth)acrylates are the methyl, ethyl, propyl, 15 isobutyl and tert-butyl esters.

Besides these, it is also possible to use vinyl esters and vinyl ethers as comonomers.

20 The ethylene copolymers described above may be prepared by processes known per se, preferably by random copolymerization under high pressure and at elevated temperatures. Appropriate processes are well known.

25 Other preferred elastomers are emulsion polymers, the preparation of which is described, for example, by Blackley in the monograph "Emulsion Polymerization". The emulsifiers and catalysts which may be used are known per se.

30 It is possible in principle to use homogeneously structured elastomers or else those with a shell structure. The shell-type structure is determined by the sequence of addition of the individual monomers. This sequence of addition also affects the morphology of the polymers.

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Monomers which may be mentioned here merely as examples for the preparation of the rubber portion of the elastomers are acrylates, such as n-butyl acrylate and 2-ethylhexyl acrylate, corresponding methacrylates, butadiene and isoprene, and also

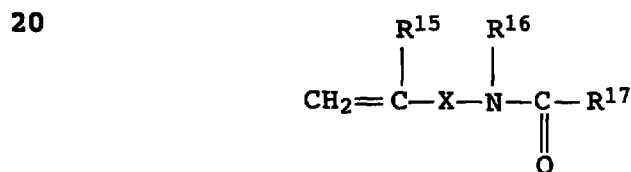
40 mixtures of these. These monomers may be copolymerized with other monomers, such as styrene, acrylonitrile, vinyl ethers and other acrylates or methacrylates, such as methyl methacrylate, methyl acrylate, ethyl acrylate and propyl acrylate.

45 The soft or rubber phase (with a glass transition temperature of less than 0°C) of the elastomers may be the core, the outer shell or an intermediate shell (in the case of elastomers with more

than two shells in their structure). In the case of elastomers with more than one shell, it is also possible for more than one shell to be composed of a rubber phase.

- 5 If besides the rubber phase one or more hard components (with glass transition temperatures above 20°C) are involved in the structure of the elastomer, then these are generally prepared by polymerizing, as principle monomers, styrene, acrylonitrile, methacrylonitrile, α -methylstyrene, p-methylstyrene or acrylates
 10 or methacrylates, such as methyl acrylate, ethyl acrylate and methyl methacrylate. Besides these, use may also be made here of smaller proportions of other comonomers.

It has proven advantageous in some cases to use emulsion polymers
 15 which have reactive groups at their surface. Examples of such groups are epoxy, amino and amide groups, and also functional groups which can be introduced by concomitant use of monomers of the formula



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 where:

- R^{15} is hydrogen or C_1 - C_4 -alkyl,
 30 R^{16} is hydrogen, C_1 - C_8 -alkyl or aryl, in particular phenyl,
 R^{17} is hydrogen, C_1 - C_{10} -alkyl, C_6 - C_{12} -aryl or $-\text{OR}^{18}$,
 R^{18} is C_1 - C_8 -alkyl or C_6 - C_{12} -aryl, which may, if desired, be
 35 substituted with O- or N-containing groups, and
 X is a chemical bond, C_1 - C_{10} -alkylene or C_6 - C_{12} -arylene or



The graft monomers described in EP-A 208 187 are also suitable for introducing reactive groups at the surface.
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Other examples which may be mentioned are acrylamide, methacrylamide and substituted (meth)acrylates, such as N-tert-butylaminoethyl methacrylate, N,N-dimethylaminoethyl acrylate, N,N-dimethylaminomethyl acrylate and N,N-diethyl-
5 aminoethyl acrylate.

It is also possible for the particles of the rubber phase to have been crosslinked. Examples of crosslinking monomers are 1,3-butadiene, divinylbenzene, diallyl phthalate and dihydrodicyclopenta-
10 dienyl acrylate, and also the compounds described in EP-A 50 265.

It is also possible to use graft-linking monomers, i.e. monomers having two or more polymerizable double bonds which react at different rates in the polymerization. Preference is given to the
15 use of those compounds in which at least one reactive group polymerizes at about the same rate as the other monomers, while the other reactive group (or reactive groups) polymerize(s), for example, markedly more slowly. The differing polymerization rates result in a certain proportion of unsaturated double bonds in the
20 rubber. If another phase is then grafted onto a rubber of this type, then the double bonds present in the rubber react at least to some extent with the graft monomers to form chemical bonds, i.e. the phase grafted on has been linked to the graft base via chemical bonds, at least to some extent.

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Examples of such graft-linking monomers are monomers containing allyl groups, in particular allyl esters of ethylenically unsaturated carboxylic acids, such as allyl acrylate, allyl methacrylate, diallyl maleate, diallyl fumarate and diallyl
30 itaconate, and the corresponding monoallyl compounds of these dicarboxylic acids. Besides these, there is a wide variety of other suitable graft-linking monomers. For further details reference may be made here to US Patent 4 148 846.

35 The proportion of these crosslinking monomers in component D) is generally up to 5% by weight, preferably not more than 3% by weight, based on D).

Some preferred emulsion polymers will be mentioned below. The
40 first graft polymers mentioned here have a core and at least one outer shell, with the following structure:

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	Monomers for the core	Monomers for the shell
5	1,3-butadiene, isoprene, n-butyl acrylate, ethylhexyl acrylate or mixtures of these, if desired together with crosslinking monomers	styrene, acrylonitrile, (meth)-acrylates, if desired with reactive groups as described herein

10 Instead of graft polymers with more than one shell in their structure it is also possible to use homogeneous elastomers, i.e. those with a single shell, made from 1,3-butadiene, isoprene and n-butyl acrylate or copolymers of these. These products, too, may be prepared by concomitant use of crosslinking monomers or of monomers with reactive groups.

15 The elastomers D) described may also be prepared by other conventional processes, e.g. by suspension polymerization.

20 Other suitable elastomers which may be mentioned are thermoplastic polyurethanes, as described in EP-A 115 846, for example.

It is, of course, also possible to use mixtures of the types of rubber listed above.

25 The novel molding compositions may also comprise other conventional additives and processing aids. Merely as examples, mention may be made here of additives to scavenge formaldehyde, plasticizers, coupling agents and pigments. The proportion of such additives is generally in the range from 0.001 to 5% by weight.

30 The novel thermoplastic molding compositions are prepared by mixing the components in a manner known per se, and detailed information is therefore not necessary here. It is advantageous to mix the components in an extruder.

40 The novel thermoplastic molding compositions have a balanced property profile and a good rate of crystallization, and can therefore be processed at higher rates to give moldings, e.g. by injection molding. Such moldings are therefore suitable in particular for application as molded articles such as chain links, castors, slide rails or gear wheels.

Examples

The following components were used:

5 Component A:

Polyoxymethylene copolymer made from 97.3% by weight of trioxane and 2.7% by weight of butanediol formal. The material also comprised about 3% by weight of unconverted trioxane and 5% by weight of thermally unstable fractions. After degradation of the thermally unstable fractions, the copolymer had an MFR of 7.5 ml/10 min (190°C, 2.16 kg, in accordance with ISO 1133/B)

Component B)

15 Talc (Mikro-Talc I.T. Extra)

	Particle size	%
20	< 20 μm	100
	< 10 μm	99
	< 5 μm	85
	< 3 μm	60
	< 2 μm	43

determined by sedimentation analysis.

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Component C)

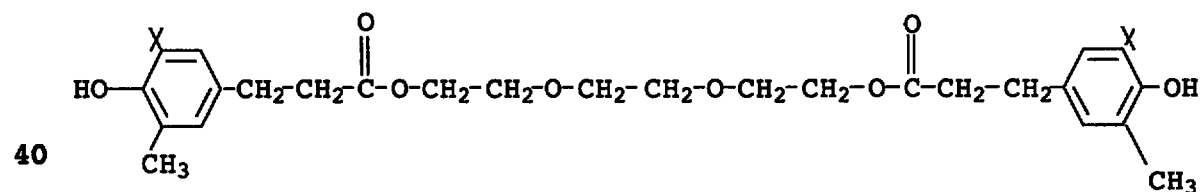
Melamine-formaldehyde condensate (MFC) in accordance with Example 1 of DE-A 25 40 207.

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Component D1)

Irganox® 245 from Ciba Geigy:

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Component D2)

A polyamide oligomer with a molecular weight of about 3000, prepared from caprolactam, hexamethylenediamine, adipic acid and 5 propionic acid (as molecular weight regulator) by a method similar to that of Examples 5-4 of US 3 960 984 (dicapped PA).

To prepare the molding compositions, component A) was mixed with the amounts given in the table of components B) to D) [lacuna] a 10 dry mixer at 23°C. The resultant mixture was introduced in a twin-screw extruder with devolatilizing equipment (ZSK 28 from Werner & Pfleiderer), homogenized at from 190 to 230°C and devolatilized, and the homogenized mixture was extruded through a die and granulated.

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Measurement of the isothermal crystallization time:

The crystallization performance of the materials was determined using DSC (Differential Scanning Calorimetry). For this, about 20 5 mg of the granules were heated at 20 K/min to 180°C, whereupon the specimen melted. This was followed by cooling to 148°C, and the time to the crystallization maximum at this temperature was measured.

25 The results of the measurements and the makeups of the molding compositions are given in the table.

Table

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30	Makeup [% by weight]					Isothermal crystallization time [min]
	1* 99.41 A	0.2 B	-	0.35 D1	0.04 D2	0.42
35	2* 99.41 A	-	0.2 C	0.35 D1	0.04 D2	0.8
	3 99.21 A	0.2 B	0.2 C	0.35 D1	0.04 D2	0.25

* for comparison

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We claim:

1. A thermoplastic molding composition comprising
 - A) from 20 to 99.9% by weight of a polyoxymethylene homo- or copolymer,
 - B) from 0.0001 to 1.0% by weight of a nucleating agent which differs from C),
 - C) from 0.001 to 5% by weight of a melamine-formaldehyde condensate, and
 - D) from 0 to 70% by weight of other additives,where the sum of the percentages by weight of components A) to D) is always 100%.
2. A thermoplastic molding composition as claimed in claim 1, in which component B) is talc.
3. A thermoplastic molding composition as claimed in claim 1 or 2, in which 100% of component B) has a particle size of < 20 μm .
4. A thermoplastic molding composition as claimed in any of claims 1 to 3, in which component C) is composed of a finely divided, crosslinked, water-insoluble precipitation polycondensate of formaldehyde and melamine in a molar ratio of from 1.2:1 to 10:1.
5. A thermoplastic molding composition as claimed in any of claims 1 to 4, comprising, as additive D), from 0.005 to 2% by weight of a sterically hindered phenol or from 0.001 to 1% by weight of a polyamide or mixtures of these.
6. A thermoplastic molding composition as claimed in any of claims 1 to 5, in which component D) is a sterically hindered phenol with not more than one sterically hindered group in ortho position to the phenolic hydroxyl group.
7. The use of the thermoplastic molding compositions as claimed in any of claims 1 to 6 for producing fibers, films or moldings.



8. A molding obtainable from the thermoplastic molding compositions as claimed in any of claims 1 to 6.

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