Claims

1. Vulcanizable rubber composition comprising at least the following components:

   a) at least one functionalized polymer,

   b) at least one modified polybutadiene having a proportion of cis-1,4 units of > 95% by weight and a 1,2-vinyl content of < 1% by weight, the polybutadiene having been modified by means of sulphur chlorides after the polymerization, wherein said modified polybutadiene has an abrupt increase in the Mooney viscosity (ML 1+4 at 100℃) by at least 50%, based on the Mooney viscosity (ML 1+4 at 100℃) of the polybutadiene prior to addition of the sulphur chlorides,

   c) at least one silica,

   d) at least one further filler,

   e) at least one vulcanizing agent,

   f) at least one oil and

   g) optionally at least one further rubber additive.

2. Vulcanizable rubber composition according to Claim 1, characterized in that the functionalized polymer comprises functionalized diene polymers, or diene copolymers obtainable by copolymerization of dienes with vinylaromatic monomers.

3. Vulcanizable rubber composition according to Claim 1, characterized in that the functionalized polymer is a polybutadiene, a polyisoprene, a butadiene-isoprene copolymer, a butadiene-styrene copolymer, an isoprene-styrene copolymer or a butadiene-isoprene-styrene terpolymer.

4. Vulcanizable rubber composition according to Claim 1, characterized in that the functionalized polymer comprises end group-functionalized butadiene-styrene copolymers prepared by solution polymerization.

5. Vulcanizable rubber composition according to Claim 4, characterized in that the end group-functionalized butadiene-styrene copolymer has Mooney viscosities (ML 1+4 (100℃)) of 10 to 200, preferably 30 to 150 Mooney units.

6. Vulcanizable rubber composition according to Claim 5, characterized in that the end group-functionalized butadiene-styrene copolymer has mean molar masses (number-average, Mn) of 10 000 to 2 000 000 g/mol, preferably of 100 000 to 1 000 000 g/mol.

7. Vulcanizable rubber composition according to Claim 6, characterized in that the end group-functionalized butadiene-styrene copolymer has a glass transition temperatures of -110℃ to +20℃, preferably -110℃ to 0℃.

8. Vulcanizable rubber composition according to Claim 7, characterized in that the modified polybutadiene is polymerized by solution polymerization in the presence of at least one inert organic solvent and in the presence of at least one catalyst based on neodymium compounds within a temperature range from -20℃ to 150℃, the polymerization is stopped by ad ding protic compounds and the polymer is modified by means of sulphur chlorides.

9. Vulcanizable rubber composition according to Claim 8, characterized in that the sulphur chlorides, prior to addition, are treated with a carboxylic acid, fatty acid and/or fatty acid ester.

10. Vulcanizable rubber composition according to Claim 9, characterized in that the sulphur chlorides are disulphur dichloride, sulphur chloride, sulphur bromide, sulphur dichloride, thionyl chloride, disulphur dibromide and/or thionyl bromide.

11. Vulcanizable rubber composition according to Claim 10, characterized in that the modified polybutadiene after the polymerization has a Mooney viscosity (ML 1+4 at 100℃) (starting Mooney viscosity) of at lea st 20 MU, preferably 20-25 MU, more preferably at least 40 MU, and after the addition of sulphur chlorides has a Mooney viscosity (ML 1+4 at 100℃) (final Moo ney viscosity) of at least 30 MU, preferably 40-50 MU, more preferably 60-80 MU, where the gel content is less than 1% by weight.

12. Vulcanizable rubber composition according to any of the preceding Claims 1-11, comprising

a) 50 to 90 parts by weight, preferably 60 to 70 parts by weight, of at least one functionalized solution butadiene-styrene copolymer (SSBR) (oil-free) having a glass transition temperature (Tg) between -110℃ to 20℃, based on the oil-free SSBR,

b) 10-50 parts by weight, preferably 20 to 40 parts by weight, of at least one modified neodymium-catalysed polybutadiene (NdBR) having a Mooney viscosity (ML 1+4 at 100℃) of at least 30 MU, wherein the modified neodymium-catalysed polybutadiene having been modified by means of sulphur chlorides after the polymerization and wherein said modified neodymium-catalysed polybutadiene has an abrupt increase in the Mooney viscosity (ML 1+4 at 100℃) by at least 50%, based on the Mooney viscosity (ML 1+4 at 100℃) of the modified neodymium-catalysed polybutadiene prior to addition of the sulphur chlorides

c) 50-120 parts by weight, preferably 60-100 parts by weight, of at least one silica,

d) 2-25 parts by weight, preferably 5-10 parts by weight, of at least one further filler,

e) 1-5 parts by weight, preferably 2-4 parts by weight, of at least one vulcanizing agent,

f) 5-50 parts by weight, preferably 10-40 parts by weight, of at least one oil,

g) optionally 1-7 parts by weight, preferably 2-5 parts by weight, of at least one rubber additive,

where the parts by weight figures for components c)-g) are each based on 100 parts by weight of rubber (sum total of a) and b)).

13. Vulcanizable rubber composition according to Claim 12, characterized in that the further filler is carbon black.

14. Process for producing vulcanizable rubber compositions according to any of Claims 1 to 13, characterized in that components a) to f) and optionally g) are mixed with one another in one or more stages, preferably either by a three-

stage mixing operation with two mixing stages in an internal mixer and a final mixing stage on a roller, or by a two-stage mixing operation in which the 1st mixing stage is effected in an internal mixer and the 2nd mixing stage on a roller, or by a two-stage mixing operation in which both mixing stages are effected in an internal mixer, with cooling of the mixture to temperatures of < 120℃, preferably < 110℃, prior to addition of t hose components which are added on the roller in a three-stage mixing operation.

15. Process for producing vulcanizates, characterized in that vulcanizable rubber compositions according to any of Claims 1 to 14 are subjected to a crosslinking reaction, preferably at a temperature in the range from 100 to 250℃, especially from 130 to 180℃, under a pressure in the range fr om 1 to 200 bar.

16. Process according to Claim 15, characterized in that the crosslinking takes place in the course of a shaping operation.

17. Vulcanizates obtainable by the process according to Claim 15 or 16.

18. Use of vulcanizable rubber composition according to any of Claims 1 to 13 for production of pneumatic tyres, especially winter tyres, tyre components, especially tyre treads, subtreads, carcasses, sidewalls, reinforced sidewalls for runflat tyres and apex mixtures, and for the production of industrial rubber articles, preferably damping elements, roll coverings, conveyor belt coverings, drive belts, spinning cops, seals, golfball cores and shoe soles.