Patent Claims

1. Casting composition based on at least one transparent silicone or epoxy resin comprising inorganic phosphor particles and glass and/or silica particles and a UV or blue light-emitting diode.

2. Casting composition according to Claim 1, characterised in that the glass and/or silica particles and the phosphor particles are homogeneously distributed in the casting composition.

3. Casting composition according to Claim 1, characterised in that the glass and/or silica particles are dispersed and aligned in a plane-parallel manner in the casting composition and are arranged directly on an additional casting composition which comprises exclusively the phosphor particles as a separate diffusion barrier layer.

4. Casting composition according to one or more of Claims 1 to 3, characterised in that the glass and/or silica particles have a diameter of 5 to 20 µm and a thickness of 0.1 to 5 µm.

5. Casting composition according to one or more of Claims 1 to 4, characterised in that the average particle diameter d_{50} of the phosphor particles is < 20 µm.

6. Casting composition according to one or more of Claims 1 to 5, characterised in that the inorganic phosphor particles are selected from the following group:
   $(Y, Gd, Lu, Sc, Sm, Tb)_3 (Al, Ga)_5O_{12}$:Ce (with or without Pr), $(Ca, Sr Ba)_2SiO_4$:Eu, $YSiO_2N$:Ce, $Y_2Si_3O_3N_4$:Ce, $Gd_2Si_3O_3N_4$:Ce, $(Y,Gd,Tb,Lu)_3Al_{5-x}Si_xO_{12-x}N_x$:Ce, $BaMgAl_{10}O_{17}$:Eu, $SrAl_2O_4$:Eu, $Sr_4Al_{14}O_{25}$:Eu,

$(Ca,Sr,Ba)Si_2N_2O_2:Eu$, $SrSiAl_2O_3N_2:Eu$, $(Ca,Sr,Ba)_2Si_5N_8:Eu$, $CaAlSiN_3:Eu$, zinc alkaline earth metal orthosilicates, copper alkaline earth metal orthosilicates, iron alkaline earth metal orthosilicates, molybdates, tungstates, vanadates, group III nitrides, oxides, in each case individually or mixtures thereof with one or more activator ions, such as Ce, Eu, Mn, Cr and/or Bi

7. Casting composition according to Claim 6, characterised in that the inorganic phosphor particles are orthosilicates.

8. Process for the preparation of a casting composition based on at least one transparent silicone or epoxy resin comprising inorganic phosphor particles and glass and/or silica particles and a UV or blue light-emitting diode, characterised by the process steps of:
a) homogeneous mixing of inorganic phosphor particles with pulverulent glass and/or silica particles
b) dispersal of the mixture of phosphors and glass and/or silica particles with the transparent silicone or epoxy resin.
c) coating of the blue light-emitting diode with silicone or epoxy resin which comprises the phosphor and the glass and/or silica particles.
d) curing of the coating.

9. Process for the preparation of a casting composition based on at least one transparent silicone or epoxy resin comprising inorganic phosphor particles and glass and/or silica particles and a UV or blue light-emitting diode, characterised by the process steps of:
a) dispersal of the inorganic phosphor particles with silicone or epoxy resin.
b) coating of the light-emitting diode with the mixture of phosphor particles and silicone or epoxy resin.
c) curing of the coating
d) dispersal of the glass or silica particles in silicone or epoxy resin.
e) production of a diffusion barrier layer by coating the cured phosphor

coating

f) curing of the diffusion barrier layer.

10. Process according to Claim 8 and/or 9, characterised in that the glass and/or silica particles are surface-coated with organosilicon compounds.

Patent Claims

1. Casting composition based on at least one transparent silicone or epoxy resin comprising inorganic phosphor particles and glass and/or silica particles and a UV or blue light-emitting diode, characterised in that the glass and/or silica particles have a diameter of 5 to 20 µm, have a thickness of 0.1 to 5 µm and are in flake-form.

2. Casting composition according to Claim 1, characterised in that the glass and/or silica particles and the phosphor particles are homogeneously distributed in the casting composition.

3. Casting composition according to Claim 1, characterised in that the glass and/or silica particles and the phosphor particles are each located within separate layers of the casting composition.

4. Casting composition according to Claim 3, characterised in that the glass and/or silica particles are dispersed and each aligned in a plane substantially parallel to and opposite a tangent to a curved face of the phosphor particle containing layer of the casting composition and wherein the glass and/or silica particles containing layer of the casting composition overlie the phosphor particle containing layer.

5. Casting composition according to one or more of Claims 1 to 4, characterised in that the average particle diameter d_{50} of the phosphor particles is <20 µm.

6. Casting composition according to one or more of Claims 1 to 5, characterised in that the inorganic phosphor particles are selected from the following group:
   (Y, Gd, Lu, Sc, Sm, Tb)$_3$ (Al, Ga)$_5$O$_{12}$:Ce (with or without Pr), (Ca, Sr Ba)$_2$SiO$_4$:Eu, YSiO$_2$N:Ce, Y$_2$SiO$_3$N$_4$:Ce, Gd$_2$Si$_3$O$_3$N$_4$:Ce, (Y,Gd,Tb,Lu)$_3$Al$_5$-xSixO$_{12-x}$N$_x$:Ce, BaMgAl$_{10}$O$_{17}$:Eu, SrAl$_2$O$_4$:Eu, Sr$_4$Al$_{14}$O$_{25}$:Eu,

$(Ca,Sr,Ba)Si_2N_2O_2:Eu$, $SrSiAl_2O_3N_2:Eu$, $(Ca,Sr,Ba)_2Si_5N_8:Eu$, $CaAlSiN_3:Eu$, zinc alkaline earth metal orthosilicates, copper alkaline earth metal orthosilicates, iron alkaline earth metal orthosilicates, molybdates, tungstates, vanadates, group III nitrides, oxides, in each case individually or mixtures thereof with one or more activator ions, such as Ce, Eu, Mn, Cr and/or Bi.

7. Casting composition according to Claim 6, characterised in that the inorganic phosphor particles are orthosilicates.

8. Process for the preparation of a casting composition according to one or more of Claims 1 to 7, characterised by the process steps of:
a) homogeneous mixing of inorganic phosphor particles with pulverulent glass and/or silica particles;
b) dispersal of the mixture of phosphors and glass and/or silica particles with the transparent silicone or epoxy resin;
c) coating of the blue light-emitting diode with silicone or epoxy resin which comprises the phosphor and the glass and/or silica particles;
d) curing of the coating.

9. Process for the preparation of a casting composition according to one or more of Claims 1 to 7, characterised by the process steps of:
a) dispersal of the inorganic phosphor particles with silicone or epoxy resin;
b) coating of the light-emitting diode with the mixture of phosphor particles and silicone or epoxy resin;
c) curing of the coating;
d) dispersal of the glass or silica particles in silicone or epoxy resin;
e) production of a diffusion barrier layer by coating the cured phosphor coating;
f) curing of the diffusion barrier layer.

10. Process according to Claim 8 and/or 9, characterised in that the glass and/or silica particles are surface-coated with organosilicon compounds.