CLAIMS

1. A biaxially oriented polypropylene film comprising a polypropylene composition, wherein the polypropylene composition comprises

(i) from 90 to 99.99 wt%, based on the total weight of the polypropylene composition, of a homopolymer of propylene having a content of isotactic pentad fraction of from 93 to 98 % and a melt flow rate MFR_2 of from 0.4 to 10 g/10 min, and

(ii) from 0.0000001 to 1 wt%, based on the total weight of the polypropylene composition, of a polymeric α-nucleating agent,

wherein the biaxially oriented polypropylene film

- has a dielectric breakdown field strength Eb63.2 of at least 595 kV/mm, which is obtained as the Scale parameter α of a fitted two-parameter Weibull distribution based on 50 results, measured with active electrode area of 2.84 cm^2 using 250 V/s DC voltage ramp rate on films with a thickness of 3.8–4.2 µm,

and

- has a thickness of 2 to 5 µm, wherein further the film is stretched simultaneously in machine direction and transverse direction, wherein the draw ratio in either transverse direction or machine direction is at least 8.0.

2. The biaxially oriented polypropylene film according to claim 1, wherein the polypropylene composition further comprises

(iii) up to 9.99 wt%, based on the total weight of the polypropylene composition, of a propylene homo- or copolymer other than the homopolymer of propylene (i).

3. The biaxially oriented polypropylene film according to claim 1 or 2, wherein the polypropylene composition further comprises

(iv) from 0.01 to 1 wt%, based on the total weight of the polypropylene composition, of conventional additives.

4. The biaxially oriented polypropylene film according to any one of claims 1 to 3, wherein the polypropylene composition has an ash content of not more than 30 ppm and/or the draw ratio in either TD or MD is > 8.0 to 20.0, preferably 9.0 to 15.0.

5. The biaxially oriented polypropylene film according to any one of claims 1 to 4, wherein the polymeric α-nucleating agent is selected from the group consisting of polyvinylcyclohexane, poly(3-methyl-1-butene) and mixtures thereof.

6. The biaxially oriented polypropylene film according to claim 3, wherein the conventional additives are selected from the antioxidants, stabilisers, acid scavengers, and mixtures thereof.

7. The biaxially oriented polypropylene film according to any one of claims 1 to 6, wherein the film comprises a layer consisting of the polypropylene composition and/or the film has a thickness between > 2 and < 5 µm, preferably > 2 and 4.5 µm or 3 to 5 µm, preferably of 3.5 to 4.5 µm.

8. The biaxially oriented polypropylene film according to any one of claims 1 to 7, wherein the film also comprises a metal layer.

9. The biaxially oriented polypropylene film according to any one of claims 1 to 8, having a dielectric breakdown field strength Eb10.0 of at least 535 kV/mm.

10. A capacitor comprising an insulation film comprising a layer of the biaxially oriented polypropylene film according to any one of claims 1–9.

11. A process for producing a biaxially oriented polypropylene film comprising the steps of:

(A) providing a polypropylene composition comprising

(i) from 90 to 99.99 wt%, based on the total weight of the polypropylene composition, of a homopolymer of propylene having a content of isotactic pentad fraction of from 93 to 98 % and a melt flow rate MFR_2 of from 0.4 to 10 g/10 min, and

(ii) from 0.0000001 to 1 wt%, based on the total weight of the polypropylene composition, of a polymeric α-nucleating agent,

(B) extruding the polypropylene composition to a flat film,

(C) orienting the flat film simultaneously in the machine direction and in the

transverse direction to obtain the biaxially oriented polypropylene film, wherein the draw ratio in either transverse direction or machine direction is at least 8.0,

wherein the biaxially oriented polypropylene film has

- a dielectric breakdown field strength Eb63.2 of at least 595 kV/mm, which is obtained as the Scale parameter α of a fitted two-parameter Weibull distribution based on 50 results, measured with active electrode area of 2.84 cm^2 using 250 V/s DC voltage ramp rate on films with a thickness of 3.8–4.2 µm, and
- a thickness of 2 to 5 µm,

and

(D) recovering the biaxially oriented polypropylene film.

12. The process according to claim 11, wherein the polypropylene composition further comprises

(iii) up to 9.99 wt%, based on the total weight of the polypropylene composition, of a propylene homo- or copolymer other than the homopolymer of propylene (i).

13. The process according to claim 11 or 12, wherein the polypropylene composition further comprises

(iv) from 0.01 to 1 wt%, based on the total weight of the polypropylene composition, of conventional additives.

14. The process according to any one of claims 11 to 13, wherein simultaneous orientation of the flat film in the machine direction and in the transverse direction to obtain the biaxially oriented polypropylene film is conducted in a continuous process, preferably with a throughput of 20 kg/h to 900 kg/h, further preferred > 25 kg/h to 500 kg/h and/or the draw ratio in either TD or MD is > 8.0 to 20.0, preferably 9.0 to 15.0.

15. The process according to any one of claims 11 to 14, wherein the biaxially oriented polypropylene film has a dielectric breakdown field strength Eb10.0 of at least 535 kV/mm.