CLAIMS

[Claim 1]

A carbon-fiber chopped strand composed of 30,000 to 120,000 carbon fiber single filaments and 1 to 10 mass % of a sizing agent which bundles the single filaments, in which carbon-fiber chopped strand the ratio (Dmax/Dmin) of the maximum diameter (Dmax) and the minimum diameter (Dmin) both of the section of chopped strand is 1.0 to 1.8, the length (L) of chopped strand along the fiber direction is 3 to 10 mm, and the repose angle of chopped strand is 10 to 30°.

[Claim 2]

The carbon-fiber chopped strand according to Claim 1, wherein the ratio (L/Dmin) of the length (L) of chopped strand along the fiber direction and the minimum diameter (Dmin) of chopped strand is 4 or smaller.

[Claim 3]

The carbon-fiber chopped strand according to Claim 1, wherein the sizing agent is a polyamide resin.

[Claim 4]

A method for manufacturing a carbon-fiber chopped strand set forth in Claim 1, characterized by comprising

a step of twisting, by 0.5 to 50 times per meter, an untwisted carbon-fiber strand composed of 30,000 to 120,000 single filaments,

a step of introducing the twisted carbon-fiber strand into a sizing agent bath, followed by shaping using a grooved roller and drying, to adhere 1 to 10 mass % of the sizing agent to the twisted carbon-fiber strand to allow a carbon-fiber strand bundled, and

a step of cutting the carbon-fiber strand bundled

twisted 0.5 to 50 times per meter into a given length.

[Claim 5]

The method for manufacturing a carbon-fiber chopped strand, set forth in Claim 4, wherein the sizing agent is a polyamide resin and the sizing agent concentration in sizing agent bath is 0.5 to 30 mass %.

[Claim 6]

An assembly of carbon-fiber chopped strands each composed of 30,000 to 120,000 carbon fiber single filaments and 1 to 10 mass % of a sizing agent which bundles the single filaments, in each carbon-fiber chopped strand the ratio (Dmax/Dmin) of the maximum diameter (Dmax) and the minimum diameter (Dmin) both of the section of chopped strand being 1.0 to 1.8, the length (L) of chopped strand along the fiber direction being 3 to 10 mm, and the repose angle of chopped strand being 10 to 30°, in which assembly the remaining ratio of original carbon-fiber chopped strands original bundled is 70% or higher.

[Claim 7]

A package of carbon-fiber chopped strands, comprising

carbon-fiber chopped strands each composed of 30,000 to 120,000 carbon fiber single filaments and 1 to 10 mass % of a sizing agent which bundles the single filaments, in each carbon-fiber chopped strand the ratio (Dmax/Dmin) of the maximum diameter (Dmax) and the minimum diameter (Dmin) both of the section of chopped strand being 1.0 to 1.8, the length (L) of chopped strand along the fiber direction being 3 to 10 mm, and the repose angle of chopped strand being 10 to 30°, and

a flexible container bag which packs the carbon-fiber

chopped strands,

in which package the remaining ratio of original carbon-fiber chopped strands bundled is 70% or higher.

[Claim 8]

A method for manufacturing pellets each composed of a thermoplastic resin and a carbon fiber dispersed in the thermoplastic resin, using an extruder, which method comprising

a step of feeding directly into the hopper of an extruder from a flexible container bag, carbon-fiber chopped strands each composed of 30,000 to 120,000 carbon fiber single filaments and 1 to 10 mass % of a sizing agent which bundles the single filaments, in which carbon-fiber chopped strands the ratio (Dmax/Dmin) of the maximum diameter (Dmax) and the minimum diameter (Dmin) both of the section of chopped strand is 1.0 to 1.8, the length (L) of chopped strand along the fiber direction is 3 to 10 mm, and the repose angle of chopped strand is 10 to 30°, and

a step of kneading, in the extruder, the carbon-fiber chopped strands with a resin.

Claims

[Claim 1]

A carbon-fiber chopped strand bundled by 1 to 10 mass % of a sizing agent composed of 30,000 to 120,000 carbon fiber single filaments, in which carbon-fiber chopped strand the ratio (Dmax/Dmin) of the maximum diameter (Dmax) and the minimum diameter (Dmin) both of the section of chopped strand is 1.0 to 1.8, the fiber length (L) of chopped strand is 3 mm or more, the ratio (L/Dmin) of the fiber length (L) of chopped strand and the minimum diameter (Dmin) of chopped strand is 4 or smaller.

[Claim 2]

The carbon-fiber chopped strand according to Claim 1, wherein the fiber length (L) of chopped strand is 3 to 10 mm.

[Claim 3]

The carbon-fiber chopped strand according to Claim 1 or Claim 2, wherein the mass per unit length of chopped strand is 0.8 to 8.0 g/m.

[Claim 4]

The carbon-fiber chopped strand according to any one of Claims 1 to 3, wherein the repose angle of chopped strand is 30° or smaller.

[Claim 5]

A method for manufacturing a carbon-fiber chopped strand comprising twisting, by 0.5 to 50 times per meter, an untwisted carbon-fiber strand composed of 30,000 to 120,000 single filaments; then introducing into a sizing agent bath, followed passing through a grooved roller, and then drying with shape regulated, to adhere 1 to 10 mass % of the sizing agent to allow a carbon-fiber strand bundled; and then, cutting the carbon-fiber strand so that the fiber length (L) of chopped strand become 3 mm or more, the ratio (L/Dmin) of the length (L) of chopped strand and the minimum diameter (Dmin) of chopped strand become 4 or smaller.

[Claim 6]

An assembly of carbon-fiber chopped strands bundled by 1 to 10 mass % of a sizing agent each composed of 30,000 to 120,000 carbon fiber single filaments,

in each carbon-fiber chopped strand the ratio (Dmax/Dmin) of the maximum diameter (Dmax) and the minimum diameter (Dmin) both of the section of chopped strand is 1.0 to 1.8, the fiber length (L) of chopped strand is 3 mm or more, and the ratio (L/Dmin) of the fiber length (L) of chopped strand and the minimum diameter (Dmin) of chopped strand is 4 or smaller, in which assembly the remaining ratio of original carbon-fiber chopped strands original bundled is 70% or higher.

[Claim 7]

A package of carbon-fiber chopped strands, comprising carbon-fiber chopped strands packed in a flexible container bag wherein carbon-fiber chopped strand bundled by 1 to 10 mass % of a sizing agent each composed of 30,000 to 120,000 carbon fiber single filaments, in each carbon-fiber chopped strand the ratio (Dmax/Dmin) of the maximum diameter (Dmax) and the minimum diameter (Dmin) both of the section of chopped strand is 1.0 to 1.8, the fiber length (L) of chopped strand is 3 mm or more, the ratio (L/Dmin) of the fiber length (L) of chopped strand and the minimum diameter (Dmin) of chopped strand is 4 or smaller,

in which package the remaining ratio of original carbon-fiber chopped strands bundled is 70% or higher.

[Claim 8]

A method for manufacturing pellets each composed of a thermoplastic resin and a carbon fiber, which method comprising

feeding directly into a hopper from a flexible container bag, the carbon-fiber chopped strands bundled by 1 to 10 mass % of a sizing agent each composed of 30,000 to 120,000 carbon fiber single filaments, in which carbon-fiber chopped strands the ratio (Dmax/Dmin) of the maximum diameter (Dmax) and the minimum diameter (Dmin) both of the section of chopped strand is 1.0 to 1.8, the length (L) of chopped strand is 3 mm or more, the ratio (L/Dmin) of the length (L) of chopped strand and the minimum diameter (Dmin) of chopped strand is 4 or smaller.