

Title (en)  
CARBON FIBER AND METHOD FOR PRODUCING SAME

Title (de)  
KOHLEFASER UND HERSTELLUNGSVERFAHREN DAFÜR

Title (fr)  
FIBRE DE CARBONE ET SON PROCÉDÉ DE PRODUCTION

Publication  
**EP 3808880 A1 20210421 (EN)**

Application  
**EP 19822232 A 20190617**

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Abstract (en)  
The invention aims to provide a carbon fiber that hardly suffers fractures during molding for producing a carbon fiber reinforced composite and serves to provide a carbon fiber reinforced composite having a high elastic modulus. The carbon fiber has a strand elastic modulus of 360 GPa or more, a strand strength of 3.5 GPa or more, and a single-fiber diameter of 6.0 μm or more, and further satisfying either or both of the requirements (a) and (b) specified below: (a) when one end is fixed end and the other end being free end which is capable of rotation about the axis of the fiber bundle, the residual twist count is 2 turns/m or more, and (b) the total fineness, which is the product of the single fiber fineness (g/km) and the filament number (number) of the carbon fiber, is 740 g/km or more. Furthermore, the carbon fiber meets the relationship represented by formula (1) wherein Es (GPa) is the single-fiber elastic modulus and A (N) is the loop fracture load:  $A \geq -0.0017 \times Es + 1.02$  ... formula (1). Or the carbon fiber has a single-fiber diameter of 6.0 μm or more, satisfies the relationship represented by formula (2) wherein E (GPa) is the strand elastic modulus and B (MPa) is the knot strength determined under conditions where the heat loss rate is 0.15% or less at 450 °C, and has a twist count of 20 to 80 turns/m:  $B \geq 6.7 \times 10^9 \times E - 2.85$

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