

Title (en)

Method of drawing heated yarns, thereby obtained polyester yarns and their end uses

Title (de)

Verfahren zum Verstrecken von erhitzten Garnen, damit erhältliche Polyesterfasern sowie deren Verwendung

Title (fr)

Procédé pour l'étirage de fils chauffés, fils de polyester obtenus et leurs utilisations

Publication

**EP 0579083 B1 19980603 (DE)**

Application

**EP 93110712 A 19930705**

Priority

DE 4222720 A 19920710

Abstract (en)

[origin: EP0579083A1] There is described a particularly gentle and fast process for heating and drawing yarns passing contactlessly through a heating apparatus at high speed. The process comprises the measures of: i) preheating a heat transfer gas to a temperature which is above the desired yarn temperature, and ii) feeding the preheated heat transfer gas into the yarn duct so that it impinges essentially perpendicularly on the moving yarn along a length such that the yarn heats up to the desired elevated temperature within the heating apparatus, the length of the impingement zone being such that continuous removal of the boundary layer by the impinging heat transfer gas ensures that the yarn comes into direct contact with the heat transfer gas and thus heats up very rapidly, and iii) tensioning the yarn moving contactlessly through the heating apparatus in such a way that it undergoes drawing as it passes through said heating apparatus. The invention further relates to polyester fibres having the following properties: a tenacity index TI equal to or greater than 50 and a molecular orientation MO equal to or greater than 20 or a compliance COM equal to or less than 12 and a storage modulus index SMI equal to or greater than 100, where  $TI = a1 \cdot T - a2 \cdot BE - a2 \cdot S$ ,  $MO = a3 \cdot SS - a2 \cdot BE - a2 \cdot S$ ,  $COM = a2 \cdot BE + a2 \cdot S - a4 \cdot CAO$ , and  $SMI = a1 \cdot T - 4 \cdot (a2 \cdot BE + a2 \cdot S) + A4 \cdot CAO + a3 \cdot SS - a2 \cdot DC$ , in which  $a1 = 1 \cdot (\text{tex}/\text{cN})$ ,  $a2 = 1 \cdot (1\%)$ ,  $a3 = 10 \cdot (\text{sec}/\text{km})$  and  $a4 = 10 \cdot (1\%)$ , T is the tenacity in cN/tex, BE is the breaking extension in %, S is the shrinkage in % measured at 200 DEG C in a through-circulation oven, SS is the speed of sound in km/sec measured at 25 DEG C, CAO is the crystallite axial orientation in % expressed by the Hermann orientation function, and DC is the degree of crystallisation in % measured by the method of the density gradient column. The polyester fibres of the invention can be used in particular for reinforcing plastics or for producing dimensionally stable textile fabrics.

IPC 1-7

**D02J 13/00**; **D02J 1/22**

IPC 8 full level

**D01D 5/084** (2006.01); **D01F 6/62** (2006.01); **D02J 1/22** (2006.01); **D02J 13/00** (2006.01)

CPC (source: EP US)

**D02J 1/224** (2013.01 - EP US); **D02J 13/001** (2013.01 - EP US); **Y10T 428/2913** (2015.01 - EP US); **Y10T 428/2969** (2015.01 - EP US)

Designated contracting state (EPC)

CH DE FR GB LI NL

DOCDB simple family (publication)

**EP 0579083 A1 19940119**; **EP 0579083 B1 19980603**; BR 9302819 A 19940222; CA 2100205 A1 19940111; CZ 136593 A3 19940316; DE 59308629 D1 19980709; JP H06158413 A 19940607; TW 268978 B 19960121; US 5538792 A 19960723

DOCDB simple family (application)

**EP 93110712 A 19930705**; BR 9302819 A 19930709; CA 2100205 A 19930709; CZ 136593 A 19930708; DE 59308629 T 19930705; JP 17184593 A 19930712; TW 82105668 A 19930716; US 9078793 A 19930712