TITLE

ELASTOMER FIBERS AND METHODS OF MAKING AND USING THEREOF

BACKGROUND OF THE INVENTION

The invention relates to a fiber excellent in cool contact feeling which is excellent in hand and skin touch and capable of preventing unpleasant feeling in the wet state while also having excellent elasticity. The invention also relates to fabric, clothing, and underwear excellent in cool contact feeling and obtainable by using said fiber as well as the methods of making the fibers and articles thereof.

There is a continuing, never-ending desire for more comfortable feeling articles and garments, particularly in the areas of underwear and sports and/or exercise-related apparel. Users and/or wearers of such articles and garments want them to be as comfortable and refreshing feeling as possible, including after prolonged periods of use and adverse conditions. The fibers used to make such items, specifically their composition, can have a significant impact on the performance of the items in these areas.

There is also a desire for such fibers, in addition to being more comfortable, to retain or even increase their elasticity.

US 5,167,899 discloses a melt-blowing process for producing a fiber of an extrudable polyurethane having a large amount of hard segment.

EP 2 292 822 discloses a mixed fiber spun bonded nonwoven fabric suitable for use in absorbent articles such as sanitary napkins, pantry liners, incontinence pads and disposable diapers.

SUMMARY OF THE INVENTION

The present invention provides an elastic cooling fiber with a Tg of no more than 22 degrees C and more specifically a fiber prepared from a composition comprising the reaction product of: (i) a hydroxyl terminated intermediate, comprising a polyester, a polyether, a polycarbonate or a combination thereof, wherein the intermediate has a Tg of no more than 22 degrees C; (ii) a diisocyanate: and (iii) a ~~linear alkylene glycol~~ chain extender comprising a linear alkylene glycol wherein the Tg of the composition from which the fiber is prepared is no more than 22 degrees C.

The invention provides a fabric that is made from the fibers described herein, which in some embodiments are mixed with other fibers. The invention provides an article that is made from the fabric described here.

The invention provides a method of providing a cooling effect in an article that comes into close proximity with, in some embodiments even direct contact with, human skin, including the steps of: (1) preparing a fabric comprising the fibers described herein; (2) preparing an article that comprises said fabric; (3)

bringing said article into close proximity with, in some embodiments even direct contact with, human skin.

The invention provides a method of making a fiber including the steps of: (1) preparing an elastomer resin in an internal mixing device wherein said elastomer resin is prepared by reacting: (i) a hydroxyl terminated intermediate, comprising a polyester, a polyether, a polycarbonate or a combination thereof, wherein the intermediate has a Tg of no more than 22 degrees C; (ii) a diisocyanate; and (iii) a ~~linear alkylene glycol~~ chain extender comprising a linear alkylene glycol; wherein the Tg of the composition from which the fiber is prepared is no more than 22 degrees C; and (2) melt-spinning said elastomer resin into a monofilament or multifilament fiber.

The invention provides a method of making a fabric including the steps of: (1) preparing an elastomer resin in an internal mixing device wherein said elastomer resin is prepared by reacting: (i) a hydroxyl terminated intermediate, comprising a polyester, a polyether, a polycarbonate or a combination thereof, wherein the intermediate has a Tg of no more than 22 degrees C; (ii) a diisocyanate; and (iii) a ~~linear alkylene glycol~~ chain extender comprising a linear alkylene glycol; wherein the Tg of the composition from which the fiber is prepared is no more than 22 degrees C; (2) melt-spinning said elastomer resin into a fiber, in some embodiments a monofilament or multifilament fiber; and (3) processing said fiber, optionally in combination with one or more other fibers, into a fabric.

DETAILED DESCRIPTION OF THE INVENTION

Various features and embodiments of the invention will be described below by way of non-limiting illustration.

The Cooling Effect

The invention provides a fiber excellent in cool contact feeling and also excellent in elasticity. While this cooling effect is generally observed in fabrics and/or articles made from the fiber, it is believed that the cooling effect is due to the properties of the fiber and so not dependent on the type and/or construction of the fabric and/or article involved, though these parameters may of course have a relative impact on the observed cooling effect. In other words, it is believed that the cooling effect is provided by the fiber, and more specifically, fibers having specific properties and/or chemical compositions. In this application, we often note that the fiber can give a cooling contact feeling when in contact with the skin, or even close to human skin, say on top of a layer or even two layers of clothing

between the fiber of the invention and the human skin. In some embodiments, the fiber is in direct contact with human skin. It is understood that the evaluation of the cooling effect may be done with fibers themselves, fabrics made from such fibers, any article made from such fibers and/or fabrics, or various combinations thereof.

The key factors considered responsible for the cooling effect provided by the invention are described below, primarily in the fiber section.

The Fibers

The invention provides a fiber excellent in cool contact feeling and also excellent in elasticity. The fiber can give a cooling contact feeling when in contact with the skin. The effect can be strong enough to be sensed in a sensory test.

The fiber may include a thermoplastic elastomer and may also include inorganic fillers, however, in certain embodiments; the composition is free of any inorganic filler.

The fibers of the invention may have a Tg of no more than 22 degrees C and are, as well as article made from them, exceptionally elastic and are also excellent in providing a cool contact feeling when using the fiber for clothing.

"Elastic" and "Elasticity" as used herein means that a fiber will recover at least ~~about~~ 50 percent of its stretched length after the first pull and after the fourth to 100% strain (doubled the length). Elasticity can also be described by the "permanent set" of the fiber. "Permanent Set" is the converse of elasticity. A fiber is stretched to a certain point, in some embodiments 50% of the fiber's known percent elongation at break, and subsequently released to the original position before stretch, and then stretched again. The point at which the fiber begins to pull a load is designated as the percent permanent set. "Elastic materials" are also referred to in the art as "elastomers" and "elastomeric".

The fibers of the present invention can provide this balance of benefits while also avoiding any sticky or inferior skin touch feelings, in the wet state owing to sweat and the like and therefore, which often leads to unpleasant feelings for the wearer when the fiber is used in a garment. The fibers of this invention balance all of these factors and provide superior performance in any one or any combination of these factors.

The hydroxyl terminated polyester intermediate is generally a linear polyester having a number average molecular weight (Mn) of from ~~about~~ 500 to ~~about~~ 10,000, from ~~about~~ 700 to ~~about~~ 5,000, or from ~~about~~ 700 to ~~about~~ 4,000, an acid number generally less than 1.3 and preferably less than 0.8. The molecular weight is determined by assay of the terminal functional groups and is related to the number average molecular weight. The polymers are produced by (1) an esterification reaction of one or more glycols with one or more dicarboxylic acids or anhydrides or (2) by transesterification reaction, i.e., the reaction of one or more glycols with esters of dicarboxylic acids. Mole ratios generally in excess of more than one mole of glycol to acid are preferred so as to obtain linear chains having a preponderance of terminal hydroxyl groups. Suitable polyester intermediates also include various lactones such as polycaprolactone typically made from ε-caprolactone and a bi-functional initiator such as diethylene glycol. The dicarboxylic acids of the desired polyester can be aliphatic, cycloaliphatic, aromatic, or combinations thereof. Suitable dicarboxylic acids which may be used alone or in mixtures generally have a total of from 4 to 15 carbon atoms and include: succinic, glutaric, adipic, pimelic, suberic, azelaic, sebacic, dodecanedioic, isophthalic, terephthalic, cyclohexane dicarboxylic, and the like. Anhydrides of the above dicarboxylic acids such as phthalic anhydride, tetrahydrophthalic anhydride, or the like, can also be used. Adipic acid is a preferred acid. The glycols which are reacted to form a desirable polyester intermediate can be aliphatic, aromatic, or combinations thereof, and have a total of from 2 to 12 carbon atoms, and include ethylene glycol, 1, 2-propanediol, 1, 3-propanediol, 1, 3-butanediol, 1, 4-butanediol, 1, 5-pentanediol, 1, 6-hexanediol, 2,2-dimethyl-l, 3-propanediol, 1, 4-cyclohexanedimethanol, decamethylene glycol, dodecamethylene glycol, and the like, 1, 4-butanediol is a preferred glycol.

Hydroxyl terminated polyether intermediates are polyether polyols derived from a diol or polyol having a total of from 2 to 15 carbon atoms, in some embodiments an alkyl diol or glycol which is reacted with an ether (or an epoxide) which comprises an alkylene oxide group having from 2 to 6 carbon atoms, typically ethylene oxide or propylene oxide or mixtures thereof. For example, hydroxyl functional polyether can be produced by first reacting propylene glycol

with propylene oxide followed by subsequent reaction with ethylene oxide. Primary hydroxyl groups resulting from ethylene oxide are more reactive than secondary hydroxyl groups and thus are preferred. Useful commercial polyether polyols include poly(ethylene glycol) comprising ethylene oxide reacted with ethylene glycol, poly(propylene glycol) comprising propylene oxide reacted with propylene glycol, poly(tetramethylene glycol) comprising water reacted with tetrahydrofuran (PTMEG). PTMEG is the preferred polyether intermediate. Polyether polyols further include polyamide adducts of an alkylene oxide and can include, for example, ethylenediamine adduct comprising the reaction product of ethylenediamine and propylene oxide, diethylenetriamine adduct comprising the reaction product of diethylenetriamine with propylene oxide, and similar polyamide type polyether polyols. Copolyethers can also be utilized in the current invention. Typical copolyethers include the reaction product of THF and ethylene oxide or THF and propylene oxide. These are available from BASF as Poly THF B, a block copolymer, and poly THF R, a random copolymer. The various polyether intermediates generally have a number average molecular weight (Mn) as determined by assay of the terminal functional groups which is an average molecular weight greater than ~~about~~ 700, such as from ~~about~~ 700 to ~~about~~ 10,000, from ~~about~~ 1000 to ~~about~~ 5000, or from ~~about~~ 1000 to ~~about~~ 2500. A particular desirable polyether intermediate is a blend of two or more different molecular weight polyethers, such as a blend of 2000 M_n and 1000 M_n PTMEG.

In some embodiments, the compositions of the present invention are prepared from polyethleneglycol (PEG). In other embodiments, the intermediate is a polyester made from the reaction of adipic acid with a 50/50 blend of 1, 4-butanediol and 1, 6-hexanediol.

The polycarbonate-based polyurethane resin of this invention may be prepared by reacting a diisocyanate with a blend of a hydroxyl terminated polycarbonate and a chain extender. The hydroxyl terminated polycarbonate can be prepared by reacting a glycol with a carbonate.

U.S. Patent No. 4, 131, 731 ~~is hereby incorporated by reference for its disclosure~~ discloses of hydroxyl terminated polycarbonates and their preparation. Such polycarbonates are linear and have terminal hydroxyl groups with essential

to 300 mm of mercury in the presence or absence of an ester interchange catalyst, and may also be carried out while removing low boiling glycols by distillation.

More specifically, the hydroxyl terminated polycarbonates are prepared in two stages. In the first stage, a glycol is reacted with an alkylene carbonate to form a low molecular weight hydroxyl terminated polycarbonate. The lower boiling point glycol is removed by distillation at 100°C to 300°C, preferably at 150°C to 250°C, under a reduced pressure of 10 to 30 mm Hg, preferably 50 to 200 mm Hg. A fractionating column may be used to separate the by-product glycol from the reaction mixture. The by-product glycol can be taken off the top of the column and the unreacted alkylene carbonate and glycol reactant may be returned to the reaction vessel as reflux. A current of inert gas or an inert solvent can be used to facilitate removal of by-product glycol as it is formed. When amount of byproduct glycol obtained indicates that degree of polymerization of the hydroxyl terminated polycarbonate is in the range of 2 to 10, the pressure is gradually reduced to 0.1 to 10 mm Hg and the unreacted glycol and alkylene carbonate are removed. This marks the beginning of the second stage of reaction during which the low molecular weight hydroxyl terminated polycarbonate is reacted by distilling off glycol as it is formed at 100°C to 300°C, preferably 150°C to 250°C and at a pressure of 0.1 to 10 mm Hg until the desired molecular weight of the hydroxyl terminated polycarbonate is attained. Molecular weight (Mn) of the hydroxyl terminated polycarbonates can vary from ~~about~~ 500 to ~~about~~ 10,000 but in a preferred embodiment, it will be in the range of 500 to 2500.

The second necessary ingredient to make the TPU polymer of this invention is a polyisocyanate. The polyisocyanates of the present invention generally have the formula R(NCO)n where n is generally from 2 to 4 with 2 being highly preferred inasmuch as the composition is a thermoplastic. Thus, polyisocyanates having a functionality of 3 or 4 are utilized in very small amounts, for example, less than 5% and desirably less than 2% by weight based upon the total weight of all polyisocyanates, inasmuch as they cause crosslinking. R can be aromatic, cycloaliphatic, and aliphatic, or combinations thereof generally having a total of from 2 to ~~about~~ 20 carbon atoms. Examples of suitable aromatic diisocyanates include diphenyl methane-4, 4'-diisocyanate (MDI), Hi2 MDI, m-

xylylene diisocyanate (XDI), m-tetramethyl xylylene diisocyanate (TMXDI), phenylene-1, 4-diisocyanate (PPDI), 1, 5 -na hthalene diisocyanate (NDI), and diphenylmethane-3, 3'-dimethoxy-4, 4'-diisocyanate (TODI). Examples of suitable aliphatic diisocyanates include isophorone diisocyanate (IPDI), 1, 4-cyclohexyl diisocyanate (CHDI), hexamethylene diisocyanate (HDI), l, 6-diisocyanato-2, 2,4,4-tetramethyl hexane (TMDI), 1, 10-decane diisocyanate, and trans-dicyclohexylmethane diisocyanate (HMDI). A highly preferred diisocyanate is MDI containing less than about 3% by weight of ortho-para (2,4) isomer.

The third necessary ingredient to make the TPU polymer of this invention is the chain extender. Suitable chain extenders are lower aliphatic or short chain glycols having from ~~about~~ 2 to ~~about~~ 10 carbon atoms and include for instance ethylene glycol, diethylene glycol, propylene glycol, dipropylene glycol, tripropylene glycol, triethylene glycol, cis-trans-isomers of cyclohexyl dimethylol, neopentyl glycol, 1, 4-butanediol, 1, 6-hexandiol, 1, 3-butanediol, and 1, 5-pentanediol. The present invention requires a linear alkylene glycol chain extender, but in some embodiments additional chain extenders may be used in combination with the linear alkylene glycol chain extender. In such embodiments, aromatic glycols can be used as the chain extender. Benzene glycol (HQEE) and xylylene glycols are suitable chain extenders for use in making the TPU of this invention. Xylylene glycol is a mixture of l, 4-di(hydroxymethyl) benzene and 1, 2-di(hydroxymethyl) benzene. Benzene glycol is the preferred aromatic chain extender and specifically includes hydroquinone, bis(beta-hydroxyethyl) ether also known as l, 4-di(2-hydroxyethoxy) benzene; resorcinol, bis(beta-hydroxyethyl) ether also known as l, 3-di(2-hydroxyethyl) benzene; catechol, i.e., bis(beta-hydroxyethyl) ether also known as l, 2-di(2-hydroxyethoxy) benzene; and combinations thereof. The preferred chain extender is 1, 4-butanediol.

The above three necessary ingredients (hydroxyl terminated intermediate, polyisocyanate, and chain extender) may be reacted in the presence of a catalyst.

Generally, any conventional catalyst can be utilized to react the diisocyanate with the hydroxyl terminated intermediate or the chain extender and the same is well known to the art and to the literature. Examples of suitable catalysts include the various oragno compounds, such as carbonates, of bismuth or

tin wherein the alkyl portion has from 1 to ~~about~~ 20 carbon atoms with specific examples including bismuth octoate, bismuth laurate, and the like. Preferred catalysts include the various tin catalysts such as stannous octoate, dibutyltin dioctoate, dibutyltin dilaurate, and the like. The amount of such catalyst is generally small such as from ~~about~~ 20 to ~~about~~ 200 parts per million based upon the total weight of the polyurethane forming monomers.

The TPU polymers of this invention can be made by any of the conventional polymerization methods well known in the art and literature.

In some embodiments, the polyurethanes of the invention are made via a "one shot" process wherein all the components are added together simultaneously or substantially simultaneously to a heated extruder and reacted to form the polyurethane. The equivalent ratio of the diisocyanate to the total equivalents of the hydroxyl terminated intermediate and the diol chain extender is generally from ~~about~~ 0.95 to ~~about~~ 1.10, desirably from ~~about~~ 0.97 to ~~about~~ 1.03, and preferably from ~~about~~ 0.97 to ~~about~~ 1.00. In some embodiments, the Shore A hardness of the TPU formed will typically be from less than 80A, 85A or even 95A. Reaction temperatures utilizing urethane catalyst may be from ~~about~~ 175°C to ~~about~~ 245°C or even from ~~about~~ 180°C to ~~about~~ 220°C. The molecular weight (Mw) of the thermoplastic polyurethane may be from ~~about~~ 100,000 to ~~about~~ 800,000 Daltons or from ~~about~~ 150,000 to ~~about~~ 400,000 or even from ~~about~~ 150,000 to ~~about~~ 350,000 as measured by GPC relative to polystyrene standards.

Useful additives can be utilized in suitable amounts in the TPU's described herein, where such additives may be added either before, during, or after the preparation of the TPU. Such additional additives include opacifying pigments, colorants, mineral fillers, stabilizers, lubricants, UV absorbers, processing aids, and other additives as desired. Useful opacifying pigments include titanium dioxide, zinc oxide, and titanate yellow, while useful tinting pigments include carbon black, yellow oxides, brown oxides, raw and burnt sienna or umber, chromium oxide green, cadmium pigments, chromium pigments, and other mixed metal oxide and organic pigments. Useful fillers include diatomaceous earth (superfloss) clay, silica, talc, mica, wallastonite, barium sulfate, and calcium carbonate. If desired, useful stabilizers such as antioxidants can be used and include phenolic

Table 7 – Sample Descriptions and Properties

Ex	Sample Description[1]	Hydroxyl Terminated Intermediate	Diisocyanate	Linear Alkyelene Glycol
38	Monofilament Fiber	BDO Adipate[2]	MDI	BDO
39	Monofilament Fiber	HDO Adipate[3]	MDI	BDO
40	Monofilament Fiber	BDO/HDO Adipate[4]	MDI	BDO
41	Monofilament Fiber	PTMEG	MDI	BDO
42	Monofilament Fiber	PEG	MDI	BDO
43	Monofilament Fiber	BDO Adipate[2]	HDI	BDO
44	Monofilament Fiber	HDO Adipate[3]	HDI	BDO
45	Monofilament Fiber	BDO/HDO Adipate[4]	HDI	BDO
46	Monofilament Fiber	PTMEG	HDI	BDO
47	Monofilament Fiber	PEG	HDI	BDO
48	Monofilament Fiber	BDO Adipate[2]	HMDI	BDO
49	Monofilament Fiber	HDO Adipate[3]	HMDI	BDO
50	Monofilament Fiber	BDO/HDO Adipate[4]	HMDI	BDO
51	Monofilament Fiber	PTMEG	HMDI	BDO
52	Monofilament Fiber	PEG	HMDI	BDO
53	Monofilament Fiber	BDO Adipate[2]	MDI	HDO
54	Monofilament Fiber	HDO Adipate[3]	MDI	HDO
55	Monofilament Fiber	BDO/HDO Adipate[4]	MDI	HDO
56	Monofilament Fiber	PTMEG	MDI	HDO
57	Monofilament Fiber	PEG	MDI	HDO
58	Monofilament Fiber	BDO Adipate[2]	HDI	HDO
59	Monofilament Fiber	HDO Adipate[3]	HDI	HDO
60	Monofilament Fiber	BDO/HDO Adipate[4]	HDI	HDO
61	Monofilament Fiber	PTMEG	HDI	HDO
62	Monofilament Fiber	PEG	HDI	HDO
63	Monofilament Fiber	BDO Adipate[2]	HMDI	HDO
64	Monofilament Fiber	HDO Adipate[3]	HMDI	HDO
65	Monofilament Fiber	BDO/HDO Adipate[4]	HMDI	HDO
66	Monofilament Fiber	PTMEG	HMDI	HDO
67	Monofilament Fiber	PEG	HMDI	HDO

1 – Each fabric sample is in the form of an open sock/sleeve woven from the described fiber.
2 – BDO Adipate is an adipate prepared from 1, 4-butanediol and adipic acid.
3 – HDO Adipate is an adipate prepared from 1, 6-hexandiol and adipic acid.
4 – BDO/HDO Adipate is an adipate prepared from adipic acid and a mixture of 114-butanedio and 1, 6-hexandiol.

~~Each of the documents referred to above is incorporated herein by reference.~~ Except in the Examples, or where otherwise explicitly indicated, all numerical quantities in this description specifying amounts of materials, reaction conditions, molecular weights, number of carbon atoms, and the like, are to be understood as modified by the word "about." Unless otherwise indicated, all percent values, ppm values and parts values are on

a weight basis. Unless otherwise indicated, each chemical or composition referred to herein should be interpreted as being a commercial grade material which may contain the isomers,

We claim:

1. A fiber prepared from a composition comprising the reaction product of:

(i) a hydroxyl terminated intermediate, comprising a polyester, a polyether, a polycarbonate or a combination thereof, wherein the intermediate has a Tg of no more than 22 degrees C;

(ii) a diisocyanate; and

(iii) a ~~linear alkylene glycol~~ chain extender comprising a linear alkylene glycol,wherein the Tg of the composition from which the fiber is prepared is no more than 22 degrees C.

~~2. The fiber of claim 1 wherein the Tg of the composition from which the fiber is prepared is no more than 22 degrees C.~~

~~3.~~ 2. The fiber of ~~any of the claims 1 to 2~~ claim 1 wherein (i) the hydroxyl terminated intermediate is substantially free of polyether block amide copolymers.

~~4.~~ 3. The fiber of any of the claims 1 to ~~3~~ 2 wherein the fiber has a percent elongation of 200% to 300%.

~~5.~~ 4. The fiber of any of the claims 1 to ~~4~~ 3 wherein the fiber has an effective cooling power of at least 49 watts per square meter, measured at 30% relative humidity and a 3 m/s wind speed.

~~6.~~ 5. The fiber of claim 1 wherein the fiber is substantially free of inorganic fillers.

~~7.~~ 6. The fiber of any of the claims 1 to ~~6~~ 5 wherein (i) the hydroxyl terminated intermediate comprises polyethylene glycol, (ii) the diisocyanate comprises methylene diphenyl diisocyanate; and (iii) the linear alkylene glycol chain extender comprises 1, 4-butanediol, 1, 6-hexanediol, or combinations thereof.

~~8.~~ 7. The fiber of any of the claims 1 to ~~7~~ 6 wherein the composition from which the fiber is prepared is a polymer alloy comprising:

(a) a multiphase copolymer prepared by reacting a polymer and/or copolymer segment with at least one other polymer and/or copolymer segment;

(b) a polymer blend prepared mixing a polymer and/or copolymer with at least one other polymer and/or copolymer, wherein each of the polymers and/or copolymers is compatible and/or miscible in one another; or

(c) combinations thereof.

~~9.~~ 8. The fiber of claim ~~8~~ 7 wherein said polymer alloy is derived from the reaction of: (i)(a) a polyol; (i)(b) a polyester intermediate derived from a polyol and a dicarboxylic acid; (ii) at least one diisocyanate; and (iii) at least one chain extender.

~~10.~~ 9. A fabric comprising the fiber of claim 1.

~~11.~~ 10. The fabric of claim ~~10~~ 9 wherein said fabric further comprises one or more additional fibers, other than the fiber of claim 1, wherein the fabric is 10 to 80 percent by weight of these additional fibers.

~~12.~~ 11. The fabric of claim ~~11~~ 10 wherein the additional fibers are selected from the group consisting of nylon fibers, polyester fibers, rayon fibers, acrylic fibers, and combinations thereof.

~~13.~~ 12. An article comprising the fabric of claim ~~10~~ 9.

~~14.~~ 13. The article of claim ~~13~~ 12, wherein the article is a garment and wherein the fibers of the fabric are arranged in said garment to be in direct contact with the skin of a wearer of said garment.

~~15.~~ 14. A method of providing a cooling effect in an article that comes into direct contact with human skin, comprising the steps of:

I. preparing a fabric comprising the fiber of claim 1;

II. preparing an article that comprises said fabric;

III. bringing said article into direct contact with human skin.

~~16.~~ 15. A method of making a fiber comprising the steps of:

I. preparing an elastomer resin in an internal mixing device wherein said elastomer resin is prepared by reacting:

(i) a hydroxyl terminated intermediate, comprising a polyester, a polyether, a polycarbonate or a combination thereof, wherein the intermediate has a Tg of no more than 22 degrees C;

(ii) a diisocyanate and

(iii) a linear alkylene glycol chain extender;

II. melt-spinning said elastomer resin into a monofilament or multifilament fiber.

~~17.~~ 16. A method of making a fabric comprising the steps of:

I. preparing an elastomer resin in an internal mixing device wherein said elastomer resin is prepared by reacting:

(i) a hydroxyl terminated intermediate, comprising a polyester, a polyether, a polycarbonate or a combination thereof, wherein the intermediate has a Tg of no more than 22 degrees C;

(ii) a diisocyanate and

(iii) a ~~linear alkylene glycol~~ chain extender comprising a linear alkylene glycol;wherein the Tg of the composition from which the fiber is prepared is no more than 22 degrees C; and

~~III.~~ II. melt-spinning said elastomer resin into a monofilament or multifilament fiber;

~~IV.~~ III. processing said fiber, optionally in combination with one or more other fibers, into a fabric.