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# Datasheet for the decision of 19 July 2006

**Case Number:** T 1186/01 - 3.3.07

**Application Number:** 96103901.3

**Publication Number:** 0732439

**IPC:** D06P 3/54

**Language of the proceedings:** EN

**Title of invention:**
Dyeing method

**Applicant:**
Mitsui Chemicals, Inc.

**Opponent:**
-

**Headword:**
-

**Relevant legal provisions:**
EPC Art. 56, 84

**Keyword:**
"Inventive step (no) - main request and first auxiliary request - problem and solution - obvious solution"
"Clarity (yes) - second auxiliary request"
"Remittal (yes) - second auxiliary request"

**Decisions cited:**
T 0068/85

**Catchword:**
-

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**Case Number:** T 1186/01 - 3.3.07

# D E C I S I O N
**of the Technical Board of Appeal 3.3.07**
**of 19 July 2006**

**Appellant:** Mitsui Chemicals, Inc.
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Minato-ku
Tokyo (JP)

**Representative:** Strehl Schübel-Hopf & Partner
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**Decision under appeal:** **Decision of the Examining Division of the European Patent Office posted 22 March 2001 refusing European application No. 96103901.3 pursuant to Article 97(1) EPC.**

**Composition of the Board:**

**Chairman:** S. Perryman
**Members:** B. Struif
F. Rousseau

## Summary of Facts and Submissions

I. The appeal lies from the decision of the examining division refusing European patent application No. 96 103 901.3 having a filing date of 12 March 1996 and claiming a priority of 14 March 1995 in Japan (JP 54483/95). The application as filed comprised thirteen claims. Independent claims 1 and 8 read as follows.

"1. A method of dyeing an aliphatic polyester filament with a disperse dye which comprises selecting the dyeing temperature, dyeing pH and dyeing time so as to obtain after dyeing a lowering ratio of 20 % or less of the weight average molecular weight of the aliphatic polyester filament to be dyed."

"8. A method of dyeing an aliphatic polyester filament with a disperse dye by selecting a dyeing temperature, dyeing pH and dyeing time so as to make a tensile strength of the aliphatic polyester filament 2g/denier or more after dyeing the aliphatic polyester filament."

II. During the examination procedure *inter alia* the following documents were cited:

D1: WO-95/07311 published on 16 March 1995 in Japanese Language; reference was made to the corresponding US-A-5 593 778 (D1a) published on 14 January 1997

D2: P. A. Pavis et al: "Der Einfluß von Computer-Kontrollsystemen auf den Färbeprozess", Textilveredelung, vol. 18, No. 5, 1983, pages 162-168,

D3: Encyclopedia of Chemical Technology, 3 rd edition, 1979, John Wiley & Sons Inc., vol. 8., pages 305-307

The decision was based on a set of claims 1 to 7 submitted with letter dated 15 November 2000 as the sole request. Claims 1 and 5 read as follows:

"1. A method for dyeing an aliphatic polyester filament with a disperse dye by immersing the filament to be dyed in an aqueous medium comprising the disperse dye, wherein the dyeing temperature is 70 to 120°C, the dyeing pH is 4 to 9, and the dyeing time is 30 to 120 minutes after reaching the dyeing temperature, the dyeing temperature, dyeing pH and dyeing time being chosen so as to obtain a lowering of the weight average molecular weight of the aliphatic polyester filament by the dyeing step of 20 % or less, based on the aliphatic polyester filament to be dyed, wherein the aliphatic polyester is chosen among polymers and copolymers of aliphatic hydroxy carboxylic acids, aliphatic polyesters obtained by polycondensation of an aliphatic polybasic acid and an aliphatic polyhydric alcohol or copolymers of polylactic acid with an aliphatic polyester obtained by condensation of an aliphatic polyhydric alcohol with an aliphatic polybasic acid."

"5. A method of dyeing an aliphatic polyester filament with a disperse dye by immersing the filament to be dyed in an aqueous medium comprising the disperse dye, wherein the dyeing temperature is 70 to 120°C, the dyeing pH is 4 to 9 and the dyeing time is 30 to 120 minutes after reaching the dyeing temperature, which comprises selecting the dyeing temperature, dyeing pH

and dyeing time so as to achieve a tensile strength of the aliphatic polyester filament 2g/denier or more after dyeing the aliphatic polyester filament, wherein the aliphatic polyester is chosen among polymers and copolymers of aliphatic hydroxy carboxylic acids, aliphatic polyesters obtained by polycondensation of an aliphatic polybasic acid and an aliphatic polyhydric alcohol or copolymers of polylactic acid with an aliphatic polyester obtained by condensation of an aliphatic polyhydric alcohol with an aliphatic polybasic acid."

III. The examining division held that:

(a) As regards clarity, independent claims 1 and 5 defined processes for dyeing aliphatic polyester with a disperse dye in such a way as to obtain either a reduction of weight average molecular weight of the dyed polyester of not more than 20% (claim 1) or so that the polyester had a tensile strength of at least 2 g/denier by selecting temperature, pH and time for the dyeing step. The dyeing composition and further variables capable of influencing the result were merely defined by their effects in interaction with a non-specified aliphatic polyester and amounted to a mere desideratum rather than stating in clear and concise manner the technical features necessary to define the subject-matter for which protection is sought. Furthermore, essential features necessary to unambiguously define the subject-matter are not mentioned in the claims, such as the starting molecular weight or tensile strength of the aliphatic polyester, the concentration of the dye,

the presence and nature of a solvent, the amount of the dye bath per unit polyester, the pressure during dyeing. In particular, the definition of the final tensile strength of an undefined polyester filament without even addressing the initial strength of said filament in claim 5 was obscure.

(b) As regards inventive step, D1 disclosed a dyeing process of a aliphatic polyester with a disperse dye and a dyeing solution prepared in a usual manner and at 25 to 95°C for 30 min and further at 95°C for 30 min. The polylactic acid homopolymer had a strength of 3.2 g/d and an average molecular weight of 62 000 prior to dyeing. The definition of the weight average molecular weight loss and the upper limit of the tensile strength in claims 1 and 5 was a result to be achieved and did not provide any sensible limitation of the claims. Thus, the only difference between the claimed subject-matter and D1 was the definition of a pH range. However, according to D3 usual pH-values for applying disperse dyes to polyester fibres under atmospheric pressure were 4.5 to 5. Thus, by these process conditions the features as specified in claims 1 and 5 would inherently be obtained when following the teachings of D1. The general concept of selecting or controlling the parameters such as temperature, pH and time of a dye bath when dyeing polyester fibres with disperse dyes was well known in the art (D2). Consequently, the combination of the teachings of D1 with D2 and D3 rendered the claimed subject-matter obvious. Hence,

the claimed subject-matter did not involve an inventive step.

IV. On 14 May 2001, the applicant (appellant) filed a notice of appeal against the above decision, the prescribed fee being paid on the same day. In the statement setting out the grounds of appeal filed on 1 August 2001, the appellant requested the grant of a patent on the basis of a set of claims 1 to 7 underlying the decision under appeal. Furthermore the following documents were submitted:

D4: Römpp's Chemielexikon, 8th edition, page 3285, 3286
D5: Römpp's Chemielexikon, 8th edition, page 859
D6: Römpp's Chemielexikon, 8th edition, pages 4170 and 4333

V. In a communication accompanying the summons to oral proceedings, the board addressed *inter alia* unity, novelty, clarity and inventive step. In reply to that communication, the appellant, by letter dated 22 June 2006, filed a new set of claims 1 to 4 (main request) and four auxiliary requests. In these requests former claims 5 to 7 were cancelled to establish unity of the invention.

VI. Oral proceedings were held on 19 July 2006. During these oral proceedings the appellant submitted three sets of claims as second, third and fourth auxiliary request.

Claim 1 of the main request corresponded to claim 1 of the main request underlying the decision under appeal. Claim 1 of the first auxiliary request differed from

claim 1 of the main request in that at the end thereof the following feature was added:

– ", wherein the aliphatic polyester filament is drawn to a draw ratio of 4 to 15 times before being dyed."

Claim 1 of the second auxiliary request differed from claim 1 of the main request in that at the end thereof the following feature was added:

", wherein the aliphatic polyester filament is drawn to a draw ratio of 4 to 15 times before being dyed, with the proviso that the draw ratio is 10 times in the case of fibers of polylactic acid and fibers of polybutylene succinate."

VII. The arguments of the appellant can be summarized as follows:

(a) As regards clarity, the objected feature in claim 1 was indeed a functional feature which defined a result to be achieved. That feature was however in line with the established jurisprudence, in particular T 68/85. The requirements of that decision were fulfilled, since the features of claim 1 could not be defined more precisely without restricting the scope of the invention and since the critical parameters of the method were already specified by the dyeing temperature, the dyeing pH and the dyeing time. The lowering of the weight average molecular weight of 20% or less could be determined on the dyed filaments. Features other than those claimed were not

essential. Thus, the claimed subject-matter met clarity according to Article 84 EPC.

(b) As regards novelty, D1 disclosed certain dyeing conditions with respect to polyesters comprising 3% of sulfoisophthalic acid and a comparative polyester consisting of polylactic acid without explicitly mentioning the pH value. Hence, D1 did not disclose the combination of dyeing temperature, dyeing pH and dyeing time so as to result in an aliphatic polyester filament having a weight average molecular weight loss of 20% or less.

(c) As regard inventive step, D1 was considered to be the closest state of the art. According to D1 certain aliphatic polyester filaments after dyeing had disadvantageous properties. According to the patent in suit the dyeing operation was liable to decompose aliphatic polyester resins and caused a deterioration of the properties. Thus, the problem to be solved over D1 was to provide a method for dyeing aliphatic polyester filaments which were not much degraded and provided suitable dyeing and physical properties of the fibers such as fastness, exhaustion of the bath and a low reduction in tensile strength.

D1 neither disclosed the claimed pH range nor the combination of the method parameters as claimed to achieve the reduced molecular weight loss. The specific lowering ratio of the molecular weight was not part of the problem but part of the solution, which made a contribution to the state of the art and was not suggested by the cited

references. Thus, there was no incentive to modify the dyeing method of D1 in the direction as claimed. D3 only disclosed the dyeing of aromatic polyester fibres but not of aliphatic polyester fibres as confirmed by Documents D4 to D6. Consequently, the term "in a usual manner" as specified in D1, column 48 provided no incentive to apply the dyeing method as disclosed in D3 to aliphatic polyesters of D1. Hence, the claimed subject-matter involved an inventive step.

The Claims 1 of the auxiliary requests were furthermore restricted with respect to the drawing ratio of the filament. In particular, the second auxiliary request provided a further distinction over a comparative example of the closest state of the art, which comparative experiment related to a specific aliphatic polyester showing poor dyeing properties. Thus, D1 could no longer form the basis for a valid attack on inventive step.

VIII. The appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of the claims of the main request or of the first auxiliary request filed with letter dated 22 June 2006 or of the second, third or fourth auxiliary request submitted at oral proceedings on 19 July 2006.

## Reasons for the Decision

1. The appeal is admissible.

*Unity of the invention*

2. Independent claims 5 to 7 of the main request underlying the decision under appeal have been cancelled, by which the objection to lack of unity has been remedied. The auxiliary requests have been drafted in accordance with the main request in that respect.

*Amendments*

3. Claims 1 to 4 of present main request correspond to claims 1 to 4 of the main request underlying the decision under appeal.

3.1 The decision under appeal had not objected to the amendments under Article 123(2) EPC. The board sees no reason to take a different view, since the claims have the following basis in the application as filed:

- claim 1: original claims 1, 3 and 5 in connection with the description, pages 4 and 5, bridging paragraph and page 10, second and fourth paragraph. The lowering of the weight average molecular weight is based on the aliphatic polyester filament to be dyed as illustrated in all the examples;

- claims 2 to 4: original claims 2, 4 and 6, respectively.

3.2 In claim 1 of the first auxiliary request the following amendment at the end of claim 1 of the main request has been made:

– ", wherein the aliphatic polyester filament is drawn to a draw ratio of 4 to 15 times before being dyed."

That amendment is based on page 8, lines 11 and 12 of the application as filed.

3.3 In claim 1 of the second auxiliary request the following amendment at the end of claim 1 of the first auxiliary request has been made:

3.4 ", with the proviso that the draw ratio is 10 times in the case of fibers of polylactic acid and fibers of polybutylene succinate."

That amendment is based on the application as filed, page 11, lines 2 and 5 from the bottom. It is noted that a draw ratio of ten times is used in all examples except for comparative example 3 in which an undrawn fiber is used. The specified draw ratio of 10 is within the general disclosed range of 4 to 15 (page 8, lines 11 and 12). Polylactic acid and polybutylene succinate are disclosed as preferred aliphatic polyesters (page 5, line 9 and page 6, line 9 from the bottom). Hence, the disclosure in the application as filed provides a basis for a drawing ratio of 10 times with respect to fibers of polylactic acid and polybutylene succinate without further details being necessary.

3.5 Hence, the amendments to the claims of the main, first and second auxiliary request can directly and unambiguously be derived from the application as filed. Consequently, the amendments of the claims meet the requirements of Article 123(2) EPC.

*Priority*

4. The application as filed claims a priority date of 14 March 1995 in Japan based on JP 54 483/95. The decision under appeal already stated that the claimed subject-matter was not entitled to the claimed priority (point 2 of "I. Summary of Facts and Submissions"). That finding has never been contested by the appellant. The board has no reason to take a different view. Hence, the application as filed only benefits from a filing date of 12 March 1996.

D1 (WO-A-95/07311) having a publication date of 16 March 1995 is thus prior art under Article 54(2) EPC and can be used to evaluate inventive step. In the following, reference is made to US-A-5 593 778 (D1a) corresponding to D1 as used throughout the procedure, which content was considered by the examining division and the appellant to be identical to D1.

*Novelty*

5. Novelty has not been objected to in the decision under appeal. The board has no reason to take a different view as will also become apparent from the discussion of inventive step.

*Inventive step*

*Closest state of the art*

6. The patent in suit concerns a method for dyeing polyester fibres. Such a dyeing method is in particular known from D1a, which the examining division and the appellant considered as the closest prior art document. The board sees no reason to take a different view as can be seen from the following:

6.1 D1a discloses a biodegradable copolyester comprising an L-lactic acid and/or D-lactic acid component as a main component and having a weight average molecular weight of at least 50,000, produced by copolymerizing said lactic acid component with at least one member of (A) 0.1 to 15% by weight of a polyethylene glycol having a number average molecular weight of at least 300, (B) an aliphatic polyester and (C) a sulfo group-containing aromatic compound having two ester-forming groups (claim 1).

6.1.1 A preferred copolyester is produced by copolymerizing 99.9 to 85% by weight of the L-lactic acid and/or D-lactic acid component and 0.1 to 15% by weight of the polyethylene glycol having a number average molecular weight of at least 300, and the melting point is not less than 110°C (claim 2). The weight average molecular weight of that copolymer is preferably not less than 80,000 (claim 3).

6.1.2 Another preferred copolyester is produced by copolymerizing 99.5 to 80% by weight of the L-lactic acid and/or D-lactic acid component and 0.5 to 20% by

weight of the sulfo group-containing aromatic compound having two ester-forming groups (claim 4).

6.1.3 Thus, D1 discloses two types of copolyesters, the first one being a pure aliphatic type of polyester (claim 2) and the second one being a copolyester which comprises a predominantly aliphatic part up to 99.5% and an aromatic part in an amount as low as 0.5% by weight (claim 3). However, also the last type of copolyester must be considered as an aliphatic type of polyester rather than an aromatic one, since the main portion thereof is an aliphatic one.

6.2 In the examples of D1a, the dyeing ability of yarn DY5 made of a poly lactide copolymer containing 3% of an sulfophthalic acid component (column 47, lines 31 to 33) is illustrated when using a basic dyeing solution (column 47, line 61 to column 48, line 7). For comparison, yarn DY6 is produced, which consists of an unmodified polylactic acid homopolymer (column 47, lines 34 to 37) having a final strength 3.2 g/d (column 47, line 49) and which has been drawn at 70°C at a draw ratio of 4.2 similar to yarn DY5 (see column 47, lines 43). Hence, yarn DY6 meets the physical requirements of the aliphatic polyester yarn as defined in claim 1 of the present main request.

6.2.1 The yarn is dyed with a dyeing solution prepared in the usual manner using a disperse dye Miketon Polyester Blue. The dyeing temperature of 95°C, and dyeing time of 30 minutes at that temperature is within the claimed range. The percentage of dye absorption is 25% and the dyeing colour is light. The change in colour after cleaning is in the grade 1 to 2 and the colour fastness

is poor (column 48, lines 12 to 19). This test result is in line with the statement in D1a, column 18, lines 61 to 63, according to which poly lactic acid is dyeable with disperse dye but poor in colour fastness. Consequently it can be concluded that in the above test yarn DY6 has been dyed.

6.3 From the above it follows that, D1a addresses aliphatic polyesters and its dyeing ability with dispersed dyes under dyeing conditions some which are identical to the claimed ones. Therefore, D1 (of which D1a can be treated as an English translation) represents the closest state of the art.

*Problem and solution*

7. The only process feature not indicated in D1a is the pH of the dyeing solution and the specific percentage of the weight average reduction (20% or less). The question arises whether or not any of those different features provides a specific technical effect.

7.1 Although examples 1 to 3 of the application in suit show some improvements under the dyeing conditions as claimed (see reduction in molecular weight, tensile strength and exhaustion of dyeing bath; table 1) over comparatives example 1 to 5 (subjected to dyeing conditions outside the claimed range), no evidence has been provided which would demonstrate that such improvement is also obtained over aliphatic polyester according to D1a.

7.2 The only technical effect evident from the examples as filed compared to D1a is that when using a poly lactic

acid homopolymer as exemplified the coloring properties (color fastness) may be improved. However, there is no evidence on file showing by what process features covered by the claims but different from those used in D1a such an effect would be achieved. In particular, the claimed subject-matter does not specify any technical feature except for the pH value and the specified weight percentage reduction not specifically mentioned in D1a, which could conceivably contribute to any improved dyeing property over the cited prior art.

In particular, since poly lactic acid used in the examples in suit has a starting molecular weight of 136 000 which is, compared to a starting molecular weight of 62 000 used in D1a (column 47, line 37), more than two times higher, the starting fiber materials subjected to the dyeing process cannot really be compared with each other. Moreover, the claimed subject-matter is not restricted to any starting molecular weight of the aliphatic polyester so that this possible difference cannot be considered as contributing to the solution of the problem either.

7.3 As regards the effect of lowering the molecular weight it should be considered, that poly lactic acid homopolymers are liable to undergo hydrolysis in water (D1a, column 3, lines 40 and 41) and that the molecular weight thereof is decreased by heating (D1a, column 1, lines 67 to column 2, line 1). Consequently, the effect of lowering the molecular weight under the dyeing conditions specified in D1a must inevitably take place. That is confirmed by the application as filed (see page 3, first complete paragraph). Hence, a reduction in molecular weight of the aliphatic polyester during

dyeing is a known problem which also arises in D1a and cannot be used to formulate a more ambitious problem.

7.4 Since there is no evidence on file that the process now being claimed shows any improvement over that of D1a, in particular, which may be attributed to a feature of the claimed subject-matter different from D1a, the problem solved over D1a has to be formulated in a less ambitious way and can only be seen in providing an alternative process to that of D1a by which similar dyeing properties can be achieved in line with the application as filed (page 3, first full paragraph).

*Obviousness*

8. Although D1a does not specify the pH value of the dyeing solution, it is prepared **in a usual manner** using Miketon Polyester Blue (column 48, lines 12 and 13; emphasis added by the board). The same type of disperse dyes is also used according to the application as filed (see page 9, third paragraph) and in examples 2 and 3 (Miketon polyester Blue RSS; page 15, line 3 and page 16, line 10). Hence, the skilled person will consider the usual conditions of a dye bath including pH values for dyeing polyester fibers with disperse dyes.

8.1 According to a standard handbook (D3) disperse dyes are suitable for dyeing polyester fibers (page 305, last six lines). The normal dye bath including disperse dyes used under atmospheric exhaust is set at a pH of 4.5 to 5 (acetic acid). These typical pH conditions for dyeing polyester fibres with disperse dyes are confirmed by D2 (pH of 4.5-5.5; page 164, middle column

first; page 165, middle column, last paragraph), which overlap with those specified in D3. The temperature of the dye bath in D3 is raised over 45 min to 100°C and run for 1-2h (see page 307, dyeing method). Consequently, the dyeing conditions specified in that handbook met all the selected requirements of claim 1. Although the polyesters fibres mentioned in D3 are a reaction product of dimethyl terephthalate and a glycol and thus relate to an aromatic polyester (page 307, "Dyeing of Polyester", first paragraph), D1a already discloses similar dyeing conditions, namely 95°C and dyeing time of half an hour, for dyeing aliphatic polyesters as well. The dyeing conditions in D1 for aliphatic polyesters and in D3 for aromatic polyesters are both within the claimed range.

8.2 Since a typical pH value of such dye baths for polyester fibres is 4.5 to 5.0 (see D3), there is a strong incentive for the skilled person to apply such usual pH conditions useful for aromatic polyesters also in the process of D1a for dyeing aliphatic polyesters.

The appellant had argued that the known and commonly used dyeing technique of aromatic polyester filaments cannot be simply and analogously applied to aliphatic polyester, because the dyeing operation is liable to decompose aliphatic polyester resin and to cause deterioration accompanied by molecular weight reduction (see application as filed, page 2, last paragraph but one).

However, there is no evidence on file establishing any prejudice in the prior art that the dyeing conditions for aromatic polyester filaments according to D3 cannot

be applied to aliphatic polyesters. Furthermore, in view of the total overlap in dyeing conditions of the claimed subject-matter with those of the cited prior art used for aliphatic and aromatic polyesters, such an argument is not convincing.

8.3 Furthermore, compared to examples 1 and 2 of the application as filed, the obviously applied dyeing conditions of 95°C, pH 4.5-5.0 and 30 min according to D1a come very close to those as exemplified. In view of the shorter dyeing time and lower temperature according to D1a, those conditions are milder than those used in example 1 of the application in suit (100°C, 1h) so that the reduction in molecular weight cannot be worse than in example 1 and thus should be less than 20%. Consequently, the claimed reduction in molecular weight is the inevitable result of the obviously applied dyeing conditions of the prior art and does not contribute to an inventive step.

8.4 From the above it follows that the claimed subject-matter is made obvious from D1 (as translated in D1a) in combination with D3 and/or D2 and does not involve an inventive step.

*First Auxiliary request*

9. Claim 1 of the first auxiliary request 1 differs from claim 1 of the main request in that the draw ratio of the aliphatic polyester is now specified to be 4 to 15. However, the yarn of the poly lactic acid of D1a is drawn at a drawing ratio of 4.2 (column 47, line 43) which lies within the draw ratio specified in claim 1

of the first auxiliary request. Thus, that amendment cannot help to establish an inventive step.

Consequently, the same considerations as outlined with respect to claim 1 of the main request (sections 4 to 7 above) apply *mutatis mutandis* to claim 1 of the first auxiliary request.

*Second auxiliary request*

*Clarity*

10. The functional feature "so as to obtain a lowering of the weight average molecular weight of the aliphatic polyester filament by the dyeing step of less than 20%, based on the aliphatic filament to be dyed", had been objected to in the decision under appeal as a result to be achieved. That feature was considered to be not concise and to be unclear. Although that definition can also be found in the claims of the main and the first auxiliary request, a decision on that point was not necessary, since those requests are not allowable for lack of an inventive step. Since the Board did not take a decision on inventive step, however, in the case of the second auxiliary request (see point 11. below), it is now necessary to address clarity.

10.1 The question arises whether the claimed subject matter meets the requirements of established case law in respect of the allowability of such functional features (see for example T 68/85; cited in Case Law of the Boards of Appeal of the European Patent Office, 4th Edition 2001, II.B.1.2.2(a)).

10.2 According to T 68/85, functional features defining a technical result are permissible in a claim, (a) if from an objective viewpoint, such features cannot otherwise be defined more precisely without restricting the scope of the invention, and (b) if these features provide instructions which are sufficiently clear for the expert to reduce them to practice without undue burden, if necessary with reasonable experiments.

10.3 In that respect, the objected feature discloses a numeric limitation of the reduction in weight average molecular weight (less than 20%). Since aliphatic polyester resins are generally degraded with ease and undergo hydrolysis in the presence of water (page 2, third paragraph) the dyeing operations are liable to decompose the polyester as well (see page 2, last but one paragraph). Furthermore, the reduction in the weight average molecular weight is influenced by the dyeing conditions (dyeing time, dyeing temperature and dyeing pH) as illustrated in the examples (see table 1). Consequently, the percentage of lowering of the molecular weight defines dyed fibres which still may be accepted for providing suitable commercial products after the dyeing operation has been applied. Since weight molecular weight reduction is a critical feature, which the skilled person can expect to be affected by the dyeing conditions of aliphatic polyesters (see page 2, last but one paragraph), the objected feature is a suitable means for limiting the process conditions without incorporating too many details in the claim. Consequently, the objected feature cannot otherwise be defined more precisely without restricting the scope of the claims and thus meets criteria (a) suggested in the decision mentioned above.

10.4 As regards requirement (b) of T 68/85, the claimed functional feature can be determined by specific measuring methods. In particular, the weight average molecular weight is measured by gel permeation chromatography at a column temperature of 40°C in a chloroform solvent by use of polystyrene standard sample as reference (see page 11, last line to page 12, line 4). Furthermore, the weight average molecular weight of the polyester before and after dyeing is indicated in the examples and the lowering based on the polyester to be dyed in percent is indicated in table 1. Hence, instructions in the application as filed for the functional feature of claim 1 are sufficiently clear for the expert to reduce them to practice without undue burden with reasonable experiments. Consequently, the functional feature of claim 1 meets the requirement of the established case law and is thus allowable under Article 84 EPC.

10.5 The features essential for defining the claims considered lacking by the first instance, such as starting molecular weight, and further dyeing conditions such as concentration of the dye, presence and nature of the solvent, the amount of dye per unit polyester, the pressure during dyeing or the presence of further components are specified merely in the examples. Such detailed features are not, however necessary to define the subject-matter for which protection is sought. None of these features is specified in description of the application as essential for solving the problem posed. That the appellant has not incorporated the above mentioned detailed features into claim 1, is thus not seen by the

board as giving rise to an objection under Article 84 EPC. It is a separate question whether or not it would be necessary to incorporate any of those features into claim 1 in order to establish an inventive step.

*Remittal to the first instance*

11. The amendments made to claim 1 of the second auxiliary request are not only specified by a general draw ratio of 4 to 15 but also by a proviso, that the draw ratio for fibres of polylactic acid and polybutylene succinate is 10. By the proviso in claim 1, the starting material to be dyed is thus different from yarn DY6, which is a polylactic acid homopolymer drawn at a ratio of 4.2. It is also noted that only this comparative example discloses a method using a disperse dye.

11.1 Since the decision of the first instance started from that comparative example and since the board also used that starting point for denying inventive step of the main and first auxiliary request, the question arises whether that approach is still applicable for claim 1 of the second auxiliary request. The board notes that the specifically drawn polylactic homopolymer used in that comparative example of D1a is no longer covered by the claims. In that case the question arises whether or not this comparative example can then be used as starting point for assessing inventive step.

On the other hand, since the claims on file (see the term "polymers and copolymers of aliphatic hydroxy carboxylic acids") do not exclude aliphatic copolyesters containing aromatic components, the

question arises whether or not the assessment of inventive step can be started from such aliphatic copolyester of D1a which provide suitable dyeing ability in general.

Since the evaluation of inventive step may possibly need a different starting point and further technical elucidation, the board uses its discretion to remit the case back to the first instance (Article 111(1) EPC).

## Order

## For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the first instance for further prosecution on the basis of claims 1 to 4 of the second auxiliary request submitted at oral proceedings on 19 July 2006.

The Registrar The Chairman

C. Eickhoff S. Perryman