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**Datasheet for the decision  
of 17 May 2018**

**Case Number:** T 0074/15 - 3.3.03  
**Application Number:** 06792394.6  
**Publication Number:** 1931727  
**IPC:** C08K5/42, C08L67/00, B32B27/34,  
B32B27/36  
**Language of the proceedings:** EN

**Title of invention:**

POLYAMIDES AND POLYESTERS BLENDED WITH A LITHIUM SALT  
INTERFACIAL TENSION REDUCING AGENT

**Patent Proprietor:**

FE Polytech, LLC

**Opponents:**

Bawden, Peter Charles  
INVISTA Technologies S.à.r.l.

**Relevant legal provisions:**

EPC Art. 56  
RPBA Art. 12(4)

**Keyword:**

Inventive step - all requests (no)  
Late-filed evidence - admitted (yes)

**Decisions cited:**

G 0007/93, T 0971/11



**Beschwerdekammern**

**Boards of Appeal**

**Chambres de recours**

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Case Number: T 0074/15 - 3.3.03

**D E C I S I O N**  
**of Technical Board of Appeal 3.3.03**  
**of 17 May 2018**

**Appellant:** FE Polytech, LLC  
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**Decision under appeal:** **Decision of the Opposition Division of the  
European Patent Office posted on 16 October 2014**

revoking European patent No. 1931727 pursuant to  
Article 101(3) (b) EPC.

**Composition of the Board:**

<b>Chairman</b>	D. Semino
<b>Members:</b>	O. Dury
	C. Brandt

## Summary of Facts and Submissions

- I. The appeal by the patent proprietor lies against the decision of the opposition division posted on 16 October 2014 revoking European patent No. 1 931 727.
- II. Claims 1 and 20 of the granted patent, which are the sole granted claims relevant to the present decision, read as follows:

"1. A resin composition comprising a polyamide comprised of at least one reaction product selected from the group consisting of the reaction of amino caproic acid with itself, or the reaction product of A-D where A is a residue of dicarboxylic acid comprising adipic acid, isophthalic acid, terephthalic acid, 1,4 cyclohexanedicarboxylic acid, resorcinol dicarboxylic acid, or naphthalenedicarboxylic acid, or a mixture thereof, and where D is a residue of a diamine comprising m-xylylene diamine, p-xylylene diamine, hexamethylene diamine, ethylene diamine, or 1,4 cyclohexanedimethylamine, or a mixture thereof, dispersed into a crystallizable polyester with at least 85% of the polyester acid units derived from terephthalic acid or the dimethyl ester of terephthalic acid, and an interfacial tension reducing agent selected from the group consisting of functionalized and non-functionalized lithium sulfonates, wherein the average diameter of dispersed particles measured in an unstretched article made from the composition is less than 150nm and the composition is void of a cobalt compound."

"20. The layer of the wall of a container comprising

the composition of any of claims 1 to 19."

- III. Two notices of opposition against the patent were filed, in each of which the revocation of the patent in its entirety was requested.
- IV. The contested decision was based on the **patent as granted as main request** and on auxiliary requests 1 and 2, both filed during the oral proceedings before the opposition division held on 1 October 2014.

Claim 1 of **auxiliary request 1** differed from granted claim 1 in that the passage related to the definition of the interfacial tension reducing agent was modified so as to read (deletions in ~~strikethrough~~, additions in **bold**):

"and an interfacial tension reducing agent selected from the group consisting of functionalized ~~and non-functionalized~~ lithium sulfonates **reacted into the backbone of the polyester,**"

Claim 1 of **auxiliary request 2** differed from claim 1 of auxiliary request 1 only in that the component "hexamethylene diamine" was deleted in the definition of D.

- V. The following documents were, *inter alia*, cited in the contested decision:

D1: JP-2-135259

D1A: English translation of D1

D5: Bandi et al., Polym. Degrad. & Stab., 88, 2005, pages 341-348

D10: WO 2005/023530

D15: Monomeric Sulphoisophthalic Acid Salts are not

- Compatibilizers"; Roolick, K.L., 03/13
- D16: "Polyesters reacted with a Copolyester containing a Metal Sulfonate Salt Group do not have better color"; Rollick, K.L.
- D17: Experimental report: rework of working example 1 of D1
- D18: Experimental Report, Dr. M. Pinnow, Fraunhofer Institute IAP, dated 1 September 2014
- D19: Expert opinion on certain aspects of D20, Prof. Dr. Mülhaupt, dated 10 May 2014
- D20: EP-B-0 964 031

Since D1 is in Japanese, any reference in the present decision to the content of that document will be made in view of its English translation, D1A.

- VI. In that decision, the opposition division *inter alia* held that the main request and auxiliary request 1 both lacked an inventive step when starting from D1A as closest prior art. Also, auxiliary request 2 was not admitted into the proceedings. Finally, whereas document D15 was admitted into the proceedings, documents D16 to D20 were not.
- VII. The patent proprietor (appellant) appealed the above decision. With the statement setting out the grounds of appeal the appellant requested that the opposition division's decision be set aside and that the oppositions be rejected or, in the alternative, that the patent be maintained in amended form according to any of auxiliary requests 1 and 2 filed therewith. In that respect, said auxiliary requests 1 and 2 corresponded to auxiliary requests 1 and 2 dealt with in the contested decision.

- VIII. In their reply to the statement of grounds of appeal each of opponents 1 and 2 (respondents 1 and 2) requested that the appeal be dismissed. Respondent 1 further requested that auxiliary request 2 be not admitted into the proceedings and that the opposition division's decision not to admit D17 and D18 be overturned. Also, respondent 2 requested that auxiliary requests 1 and 2 be not admitted into the proceedings and that the opposition division's decision not to admit D16 to D20 be overturned.
- IX. Issues to be discussed at the oral proceedings were specified by the Board in a communication.
- X. With letter dated 19 March 2018 the EPO was informed of a change of representative for respondent 2 and an authorisation (EPO form 1003), signed on 15 March 2018 in the USA by Mrs. B.C. Sciamanna was filed.
- XI. With letter dated 17 April 2018, respondent 2 submitted documents D23 to D28, which are not relevant to the present decision, and requested that they be admitted into the proceedings.
- XII. With letter dated 17 April 2018, the appellant requested that D16 be not admitted into the proceedings and submitted additional **auxiliary requests A, 1A and 2A**, which corresponded to the main request, auxiliary request 1 and auxiliary request 2, respectively, in which claim 20 was deleted.
- XIII. With letter dated 9 May 2018, respondent 2 requested that auxiliary requests A, 1A and 2A be not admitted into the proceedings.



XIV. During the oral proceedings, which were held on 17 May 2018 in the absence of respondent 1, as announced by letter of 28 November 2017, respondent 2 withdrew his request that auxiliary request 1 be not admitted into the proceedings. Also, the appellant requested that D23 to D28 be not admitted into the proceedings and indicated that the auxiliary requests were to be dealt with in the order **A, 1, 1A, 2 and 2A**.

XV. The appellant's arguments, insofar as relevant to the decision, may be summarised as follows:

#### **Representation**

(a) The professional representative of respondent 2, Mr. Pierce, was not validly authorised by the authorisation dated 15 March 2018 because there was no evidence that the signatory, Mrs. B.C. Sciamanna, was effectively entitled to give such an authorisation. Besides, signing as a procurist was usually only valid if the signatory worked for the same company as the person he is signing for, which was not mandatorily satisfied here since the appellant's company was based in Switzerland whereas the authorisation was signed in the USA.

#### **Admittance of D16, D17 and D18**

(b) D16 was directed to compositions containing cobalt, which was excluded in the composition according to granted claim 1. Besides, the explicit reference in granted claim 20 to the composition of granted claim 1 imposed that the composition that forms part of the container wall was void of cobalt. Therefore, D16 was not relevant for the decision

making process, as held by the opposition division.

- (c) D17 had no meaning for the present proceedings because it was not a proper rework of the experiments of D1A. Since D18 was related to the determination of features of a composition prepared in D17, it shared the same fate as D17 regarding its relevant and admittance into the proceedings.
- (d) For those reasons, each of documents D16 to D18 should not be admitted into the proceedings.

**Main request - Inventive step**

- (e) The closest prior art was D1A, in particular example 3 thereof.

The subject-matter of granted claim 1 differed from example 3 of D1A in the use of a lithium sulfonate compound instead of a sodium sulfonate, as well as in the fact that D1A contained no explicit disclosure of the average diameter of dispersed particles and whether or not the compositions prepared in the examples thereof were void of cobalt, both of which were explicitly defined in granted claim 1. It was in particular indicated in D1A that additives might be blended in the compositions according to D1A, whereby cobalt additives could not be excluded since they were commonly used in such compositions as shown in D5 and D10.

In the statement of grounds of appeal, the object of the patent in suit was indicated as residing in the provision of compositions having reduced haze; in this respect, the comparison between examples

B/D and C/E in working example 7 of the patent in suit showed that that problem was effectively solved. During the oral proceedings before the Board, the technical problem to be solved was held to reside in the provision of cobalt-free polyester compositions comprising dispersed polyamide domains and exhibiting reduced haze, improved colour (i.e. reduced yellowness expressed in terms of the  $b^*$  value as defined in paragraph 124 of the patent in suit) and less deformation of the polyamide domains upon stretching. Example 4 together with Table V, Example 5 together with the teaching of D5 and D10 and examples 9B and 9C of the patent in suit, respectively, showed that those problems were effectively solved.

None of the cited documents contained a hint to solve the technical problem defined above by using a lithium sulfonate compound instead of a sodium sulfonate compound. Also, considering the whole teaching of D1A, even if the skilled person were to modify example 3 of D1A, he would not modify the sulfonate component, which was the most preferred embodiment disclosed therein. In particular, the skilled person would have no motivation to change the metal of the sulfonate component.

Therefore, the subject-matter of granted claim 1 was inventive.

**Auxiliary requests - Inventive step**

- (f) The same arguments as for the main request were valid for claim 1 of each of auxiliary requests A, 1, 1A, 2 and 2A.

XVI. The respondents' arguments, insofar as relevant to the decision, may be summarised as follows:

**Representation**

(a) There was no evidence on file supporting the appellant's allegation that Mrs. B.C. Sciamanna was not entitled to authorise Mr. Pierce to represent respondent 2. To the contrary, it was explicitly indicated below the signature on the authorisation form that Mrs. B.C. Sciamanna was an "Authorized Signatory".

That objection was further put forward very late, namely during the oral proceedings of 17 May 2018, and took respondent 2 by surprise. Had it been submitted earlier, which would have been possible since the contested authorisation was filed with letter of 19 March 2018, i.e. almost two months before the oral proceedings, respondent 2 could have submitted further evidence attesting that Mrs. B.C. Sciamanna was effectively entitled to sign the authorisation form.

In any case, Mr. Pierce in his quality as European Patent Attorney confirmed that he was duly authorised.

**Admittance of D16, D17 and D18**

(b) D16 was highly relevant at least for the subject-matter of granted claim 20, which was not limited to compositions without cobalt.

Further taking into account that the appellant argued that the presence or not of cobalt had no

consequence to haze, which was a problem addressed in the patent in suit, D16 was also relevant for the assessment of inventive step for granted claim 1.

Also, since D16 was a document of the appellant himself, he could not have been taken by surprise by its content. Besides, since D16 was submitted together with the statement of grounds of appeal, both the appellant and the Board had sufficient time to deal with it, in particular because it was not of particular technical complexity.

- (c) D17 and D18 were highly relevant since they showed that working example 1 of D1A satisfied the average particle diameter of below 150 nm according to granted claim 1.
- (d) For those reasons, each of documents D16 to D18 should be admitted into the proceedings.

**Main request - Inventive step**

- (e) The closest prior art was D1A, in particular example 3 thereof.

The subject-matter of granted claim 1 differed from example 3 of D1A in the use of a lithium sulfonate compound instead of a sodium sulfonate. Since the feature "average diameter of the dispersed particle" was indicated in granted claim 1 as being determined on an article made from the composition, it was not limiting for the composition *per se*. Besides, although D1A contained no explicit disclosure of the average particle size, it was derivable from D17 and D18 and from example 2 of

the patent in suit that said feature was implicitly satisfied. Finally, in the absence of any information regarding cobalt in D1A in its whole, there was no reason to consider that the composition prepared in example 3 of D1A contained any cobalt.

Considering the improvement in haze alleged by the appellant, Example 4 together with Table IV showed that the compositions comprising a lithium sulfonate exhibited a significantly worse haze as compared to the compositions comprising a sodium sulfonate, when considering the absolute value of the haze (and not the relative change in haze reported in Table V). Besides, Example 5 and Table VI of the patent in suit did not allow any fair comparison which would allow to conclude that an improvement in colour (in terms of reduced  $b^*$ ) was related to the presence of a lithium sulfonate compound instead of a sodium sulfonate. The same was valid regarding the comparison of examples 9B and 9C and Table VIII of the patent in suit, whereby it was further to be noted that example 9C (according to granted claim 1) even showed a worse haze upon stretching than example 9B (considered for comparison by the appellant). Also, it was shown in D16 that the effects of reduced haze and improved colour claimed by the appellant were not present on the whole scope of granted claim 1. In view of the above, none of the problems mentioned by the appellant was effectively solved. Therefore, the technical problem indeed solved merely relied in the provision of further cobalt-free polyester compositions comprising dispersed polyamide domains.

Considering that D1A itself taught that lithium sulfonates could be used in alternative to the sodium sulfonates, the subject-matter of granted claim 1 was not inventive.

**Auxiliary requests - Inventive step**

(f) The same arguments as for the main request were valid for claim 1 of each of auxiliary requests A, 1, 1A, 2 and 2A.

XVII. The appellant requested that the decision under appeal be set aside and that the patent be maintained as granted (rejection of the oppositions) or, alternatively, that the patent be maintained in amended form on the basis of any of auxiliary request A filed with letter dated 17 April 2018, or auxiliary requests 1 filed with the statement of grounds of appeal, or auxiliary request 1A filed with letter dated 17 April 2018, or auxiliary request 2 filed with the statement of grounds of appeal, or auxiliary request 2A filed with letter dated 17 April 2018.

It was also requested that the opposition division's decision not to admit D16, D17 and D18 be confirmed and that D23 to D28 be not admitted into the proceedings.

Respondent 2 and respondent 1 in writing requested that the appeal be dismissed.

Respondent 1 requested in writing that auxiliary request 2 be not admitted into the proceeding and that the decision of the opposition division not to admit D17 and D18 be overturned.

Respondent 2 requested that auxiliary request 2 as well as the auxiliary requests A, 1A and 2A filed with letter dated 17 April 2018 be not admitted into the proceedings, that the decision of the opposition division not to admit D16 to D20 be overturned and that D23 to D28 filed with letter dated 17 April 2018 be admitted into the proceedings.

## **Reasons for the Decision**

### **Main request (patent as granted)**

#### 1. Representation

The Board does not follow the appellant's objection raised for the first time during the oral proceedings on 17 May 2018 that the person signing the authorisation of Mr. Pierce dated 15 March 2018 was not a person entitled to do so. The authorisation was signed by Mrs. B.C. Sciamanna, who is indicated in the authorisation form as an "Authorized signatory". The mere fact that, as argued by the appellant, the signing was executed in the USA rather than at the place of business of respondent 2 in Switzerland is, in the absence of any further facts, let alone evidence, to support such an objection, not sufficient to cast doubts on the entitlement of the signatory.

The Board further notes that, during the oral proceedings before the Board and after the appellant's objection, respondent 2 filed a copy of an authorisation relating to a case between the same parties, which bore the signature of Mrs. B.C. Sciamanna, in order to authorise the same



patent attorney association as in the present case and which was also signed at a place in the USA. The validity of that authorisation had, according to the explanation of the representative of respondent 2, Mr. Pierce, during the oral proceedings before the Board, not been contested by the adverse party in that case, which was identical to the appellant in the present case.

The Board also points out that the appellant's objection was raised at a very late stage in the proceedings, whereby the contested authorisation was filed by respondent 2 with letter of 19 March 2018, i.e. nearly two months before the date of the oral proceedings. In addition, although the appellant filed a written submission dated 17 April 2018 providing additional requests and further arguments, no objection regarding the validity of the authorisation of 15 March 2018 was made at that time. Should the appellant have raised its objection in a timely manner, i.e. before the date of the oral proceedings, respondent 2 would have had the opportunity to reply to that objection under better conditions, e.g. by filing further written evidence, without being taken by surprise at the oral proceedings.

Under those circumstances and in the absence of further evidence, the objection of the appellant that the professional representative of respondent 2, Mr. Pierce, was not validly authorised by the authorisation dated 15 March 2018 due to a missing entitlement of the signatory, Mrs. B.C. Sciamanna, is rejected.

2. Admittance of D16 to D20
  - 2.1 Respondent 2 requested that the opposition division's decision not to admit D16 to D20 into the proceedings be overturned, which was contested by the appellant. The same request was made by respondent 1 for D17 and D18.
  - 2.2 According to the case law (see Case Law of the Boards of Appeal of the EPO, 8th edition, IV.C.1.2.2.a and IV.E.3.6; see also decision G 7/93, OJ EPO 1994, 775: section 2.6 of the reasons), an opposition's division discretionary decision may be overruled by the Boards if it is established that the opposition division did not exercise its discretion in accordance with the right principles or in an unreasonable way. However, in the present case, the respondents did not argue that the opposition division did not exercise its discretion in accordance with the right principles or in an unreasonable way and the Board has no reason to deviate from that view for any of documents D16 to D20.
  - 2.3 However, the fact that the opposition division did not admit a late-filed document and did not exceed the proper limits of its discretion by not admitting it does, in principle, not prevent the Board from admitting the document pursuant to Article 12(4) RPBA, in particular if e.g. it considers it to be *prima facie* relevant (T 971/11, sections 1.1 to 1.3 of the reasons). In particular, a submission which would have been admitted into appeal proceedings if it had been filed for the first time at the outset of those proceedings should not be held inadmissible for the sole reason that it was already filed before the department of first instance and not admitted (T 971/11, section 1.3 of the reasons).

In that respect, since each of documents D16 to D18 was referred to e.g. in respondent 2's reply to the statement of grounds of appeal together with arguments why they were relevant, their admittance into the proceedings undergoes the stipulations of Article 12(4) RPBA. It is further derivable from the arguments put forward by the parties (see sections XV(b) (c) and XVI(b) (c) above) that each of D16 to D18 contains experimental data related to the issue whether or not a technical effect is effectively present in relation to the distinguishing feature over the closest prior art. Therefore, the Board is of the opinion that those documents are all *prima facie* highly relevant and that their filing, anew, in appeal is a direct reaction to the contested decision and/or to arguments put forward in the appellant's statement of grounds of appeal. Furthermore, there is no evidence that the filing of D16 to D18 again at the outset of the appeal proceedings amounts to a deliberate abuse of the procedure.

For those reasons, it is not justified, in the circumstances of the present case, that the Board makes use of its power under Article 12(4) RPBA to hold any of D16 to D18 inadmissible. Those documents are, thus, in the proceedings.

- 2.4 Although respondent 2 requested that the opposition division's decision not to admit D19 and D20 into the proceedings be overturned, none of those documents was actually relied upon by respondent 2 either in writing or during the oral proceedings before the Board. Therefore, there is no reason for the Board to overturn the opposition division's decision. As a consequence,

D19 and D20 are both held inadmissible pursuant to Article 12(4) RPBA.

3. Inventive step

3.1 Closest prior art

All parties considered, as the opposition division, that D1A, in particular, the composition of example 3 thereof, represents the closest prior art. The Board has no reason to deviate from that view.

3.2 Distinguishing feature(s) over example 3 of D1A

3.2.1 Example 3 of D1A is directed to the preparation of pellets by kneading together the following components (D1A: page 11, lines 18-26 and Table 1):

- (A) 85 pbw polyethylene terephthalate;
- (B) 5 pbw polymethaxylylene adipamide (MXD<sub>6</sub>), i.e. a polyamide as defined in granted claim 1 and obtained as reaction product of A = adipic acid and D = m-xilylene diamine;
- (C) 10 pbw copolymer polyester including 95 mol.% ethylene terephthalate and 5 mol.% sodium 5-sulfoisophthalate.

The pellets were used to make blow-moulded bottles having a haze of 6 % (D1A: page 11, line 26 to page 12, line 14; Table 1).

3.2.2 Both parties agreed that the subject-matter of granted claim 1 differs from the composition of example 3 of D1A at least in that it comprises an interfacial

tension reducing agent derived from lithium sulfonates (such as lithium 5-sulfoisophthalate).

3.2.3 It was disputed by the parties whether or not the composition prepared in example 3 of D1A implicitly satisfied the requirement of granted claim 1 that the average diameter of dispersed (polyamide) particles should be less than 150 nm, which is not explicitly disclosed in D1A.

(a) In that respect, respondent 2 argued that the feature "average diameter of the dispersed particle" which is mentioned in granted claim 1 and is defined as being determined "on an unstretched article made from the composition" was not limiting for the composition *per se*.

However, although it is correct that said feature has a broad scope, in particular following the lack of any indication in granted claim 1 of the kind of article and of any working conditions to be used to prepare said article, said feature is not meaningless but is at least limiting in that the compositions being claimed must be suitable to prepare such an article.

(b) Respondent 2 argued that it was derivable from example 2 of the patent in suit that the feature "average diameter of the dispersed particle" was implicitly satisfied by the composition of example 3 of D1A.

In its letter of 17 April 2018 (page 4, section ii), the appellant indicated that the third column of Table II of the patent in suit (labelled "Reactive extrusion (Example 2)") relied upon by

respondent 2 corresponded to compositions prepared according to paragraphs 134, 135 and 136 of the patent in suit (in that order; as derivable from the title of the column and following in Table II the same sequence as in the text of Example 2). However, it is derivable from paragraphs 133 and 135 of the patent in suit that the commercial polyesters Cleartuf<sup>®</sup> 8006S and Turbo<sup>®</sup> II used in example 2 of the patent in suit comprise isophthalic comonomers and are, thus, not identical to the polyethylene terephthalate used in example 3 of D1A. Besides, in example 2 of the patent in suit the modified polyesters also differ from the one used in example 3 of D1A (section 3.2.1, component (C)) in that it contains a different amount of sodium 5-sulfoisophthalate (0.5 mol% sodium sulfonate component in the patent in suit; 5 mol% in D1A). Finally, the compositions prepared in example 2 of the patent in suit and in example 3 of D1A are further obtained using different methods of preparation (example 2 of the patent in suit: reactive extrusion and solid phase polymerisation; example 3 of D1A: kneading). Under those circumstances, no conclusion regarding the properties of a composition prepared in example 3 of D1A may be drawn from the data reported in Table II of the patent in suit in respect of the compositions prepared in example 2. Therefore, respondent 2's argument is rejected.

- (c) Respondent 2 further argued that D18 showed that in a rework of example 1 of D1A made according to D17, the average diameter of dispersed particles of the composition of example 1 of D1A was within the range of granted claim 1. Considering that the haze of example 3 of D1A was slightly lower than that of

example 1 D1A and that haze was directly correlated to the average diameter of the dispersed polyamide domains, the average diameter feature of granted claim 1 was also satisfied in example 3 of D1A.

However, it is agreed with the appellant that D17 is not a proper rework of example 1 of D1A because:

- The composition prepared in D17 (page 2, section 8, first two paragraphs of the section "Methods") is not identical to the one of example 1 of D1A at least because the modified polyesters differ in their respective content of sodium 5-sulfoisophthalate (5 mol% in D1A: see page 11, lines 18-20; 2.15 mol% in D17: page 2, last sentence of the section "Methods/Preparation of SIPA-PET copolymer"). Therefore, also the relative amounts of unmodified polyester, polyamide and modified polyester used to prepare the whole composition having the same amount of sodium 5-sulfoisophthalate (as indicated in the last sentence of the section "Methods/Preparation of resin blends") must be different;
- It was not shown that the polyester used in D17 is a "pure" polyethylene terephthalate, i.e. without e.g. isophthalic acid comonomers, whereby the appellant argued that most commercial polyethylene terephthalate contain some isophthalic acid parts.

Therefore, D17 and D18 do not allow to conclude that the feature "average diameter of dispersed particles is less than 150 nm" according to granted claim 1 is implicitly satisfied by the composition

of example 3 of D1A.

- 3.2.4 The parties further disagreed whether or not the composition prepared in example 3 of D1A was "void of cobalt" as defined in granted claim 1.

In that respect, in the absence of any explicit information regarding cobalt in D1A, there is no reason to expect that the composition of example 3 of D1A contains any cobalt. In particular, although it is indicated at page 8, lines 22-25 of D1A that additives may be blended in the compositions according to D1A, no indication is given that such additive(s) was/were effectively used in example 3 of D1A. Therefore, even if it were to be agreed with the appellant that it was known in the art, e.g. from D5 and D10, that polyester compositions comprising dispersed polyamide were subject to yellowness and that the best choice for preventing that problem was to use a cobalt compound, this would not be sufficient to conclude that the composition prepared in example 3 of D1A must have contained cobalt. For those reasons, the Board is of the opinion that the feature "void of cobalt" is implicitly satisfied by the composition according to example 3 of D1A.

- 3.2.5 In view of the above, the subject-matter of granted claim 1 differs from example 3 of D1A in the following features:

- use of an interfacial tension reducing agent derived from lithium sulfonates instead of one derived from sodium sulfonates;
- no explicit disclosure of the average particle size of the dispersed particles is made in D1A.



3.3 Problem effectively solved

3.3.1 The appellant argued that the problem to be solved resided in the provision of cobalt-free polyester compositions comprising dispersed polyamide domains which exhibit reduced haze, improved colour (i.e. reduced yellowness expressed in terms of the  $b^*$  value as defined in paragraph 124 of the patent in suit) and less deformation of the polyamide domains upon stretching.

3.3.2 Regarding the claimed reduction of haze, the appellant relied during the oral proceedings before the Board on the comparison of the compositions named "2 mole% NaSIPA" and "0.50 mole LiSIPA, No Cobalt" of Table V of the patent in suit, whereby the appellant argued that the composition comprising a lithium sulfonate component reacted in the backbone of the polyester ("LiSIPA") showed less change in haze per mil of the stretched wall (i.e. the change in haze of a composition comprising a modified polyester comprising polyamide dispersed therein as compared to the same composition comprising no polyamide) than the composition comprising a sodium sulfonate component reacted in the backbone of the polyester ("NaSIPA").

However, the comparison between the compositions "2 mole% NaSIPA" and "0.50 mole LiSIPA, No Cobalt" comprising 3% polyamide "6007" (Table V: left hand side column, row "3% 6007") shows that the effect relied upon by the appellant is not always achieved (the change in haze of the composition comprising the lithium component being higher than the one of the composition comprising the sodium component).

Besides, as indicated by respondent 2 during the oral proceedings before the Board, whereas Table V of the patent in suit provides information regarding the change in haze, i.e. a relative parameter, the haze property of the same compositions in absolute terms is reported in Table IV of the patent in suit (as indicated on page 17, lines 50-51). In that respect, it is shown in said Table IV that the compositions comprising a lithium sulfonate component ("LiSIPA") relied upon by the appellant exhibit, for the same amount of dispersed polyamide, worse absolute values of haze. Also, the comparison in Table IV of the patent in suit of the composition "2 mole% NaSIPA" with the composition "2.00 mole LiSIPA, w/ Cobalt" at 3% polyamide, which appears to be a fair comparison made at the same molar concentration of polyester modifier (i.e. interfacial tension reducing agent reacted in the backbone of the polyester), shows that even if the change in haze is further reduced (see Table V), the absolute haze is even worse (Table IV). In that respect, it is noted that some compositions listed in Table IV of the patent in suit contained cobalt, which is excluded from the scope of granted claim 1. However, considering that the appellant constantly argued that cobalt did not play a role on haze, which was not contested by the respondents and even taken up by respondent 2, the fact that those compositions contained cobalt does not affect the above conclusions.

Similarly, and also considering that the appellant argued that cobalt compounds did not affect haze, it is also shown in D16 (Table 1: page 4 of 6: compare the first and the second entries below the "control" and the last two entries), that the improvement in haze claimed by the appellant is not present over the whole scope of granted claim 1, in particular for certain

lithium sulfonate which are reacted into the backbone of the polyester as compared to sodium sulfonated reacted into the backbone of the polyester (as derivable from the experimental procedure indicated on page 2 of D16).

In view of the above, the improvement in haze in relation to the use of a lithium sulfonate compound instead of a sodium sulfonate claimed by the appellant is rejected.

It is further noted that since the information provided in Table IV of the patent in suit and in D16 shows that the claimed improvement in haze is in any case not present on the whole scope of granted claim 1, there is no need to assess whether or not the same effect is shown to be achieved by the compositions prepared in example 7 of the patent in suit, as argued in writing by the appellant.

3.3.3 Regarding the claimed improved colour, the appellant relied during the oral proceedings before the Board on the comparison of the compositions named "0.5% LiSIPA, No Cobalt" and either "0.5% NaSIPA, Cobalt" or "2.0% NaSIPA, Cobalt" of Table VI of the patent in suit.

However, those compositions differ one from each other in the following aspects:

- the composition comprising a lithium sulfonate component reacted into the backbone of the polyester ("LiSIPA") contained, instead of a cobalt component used in the composition comprising a sodium sulfonate component reacted into the backbone of the polyester ("NaSIPA"), an additional

colour package (page 21, lines 3-8);

- the amount of interfacial tension reducing agent reacted into the backbone of the polyester was not identical (0.5% for LiSIPA; 2.0% for NaSIPA); or
- the nature of the polyamide was different (Table VI, first column: nylon grade "6001" in "0.5% NaSIPA, Cobalt"; nylon grade "6007" in "0.5% LiSIPA, No Cobalt").

Under such circumstances, in particular also taking into account that it is shown in Table III of the patent in suit that different amounts of lithium sulfonate component reacted into the backbone of the polyester ("LiSIPA") have an impact on the colour of the composition expressed in terms of the  $b^*$  value (patent in suit: page 17, lines 7-21), it cannot be concluded that the reduced  $b^*$  values obtained for the composition comprising the lithium component ("LiSIPA") as compared to the composition comprising the sodium component ("NaSIPA") is mandatorily related to the presence of the lithium component instead of the sodium component.

Besides, the comparison of the  $b^*$  values reported in Table I of D16 (page 4) for the compositions in the third and fourth rows from the bottom (2% NaSIPA compared to 2% LiSIPA), shows that the improvement in colour related to the use of a lithium sulfonate compound instead of a sodium sulfonate compound claimed by the appellant is not present over the whole scope of the claims.

In view of the above, the improvement in colour in relation to the use of a lithium sulfonate compound

instead of a sodium sulfonate claimed by the appellant is rejected.

3.3.4 Regarding the claimed reduced deformation of the polyamide domains upon stretching put forward by the appellant during the oral proceedings before the Board, the sole data relied upon by the appellant were those of examples 9B and 9C in Table VIII of the patent in suit, whereby example 9C was considered to illustrate the subject-matter of granted claim 1 whereas example 9B was a comparative example.

However, examples 9B and 9C differ one from each other in the following aspects:

- Whereby example 9B was carried out using a commercial polyester, example 9C made use of a polyester prepared according to the patent in suit (page 22, lines 49-51). Although it may be seen from the data provided in Table VIII of the patent in suit (page 23, lines 16-25) that both polyesters were similar in terms of the nature of the monomers used for their preparation, they at least did not contain the same amounts of interfacial tension reducing agents reacted into the backbone of the polyester (see the molar amounts "0.5 LiSIPA" and "1.72 NaSIPA" indicated at page 23, lines 21-24). Besides, no information was provided regarding any other important properties of the non-modified polyester used in examples 9B and 9C, such as intrinsic viscosity, melting point or crystallinity. Therefore, it cannot be concluded from the mere similarity in comonomer content that the non-modified polyesters used in examples 9B and 9C were identical or at least comparable materials;

- It is derivable from the data reported in Table VIII of the patent in suit that the average diameter of the dispersed particles in the unstretched materials were significantly different (page 23, line 30: row "Preform Domain Size (nm)") and that the conditions of stretching were also different (page 23, lines 32-34: row "Stretch Ratio of Axis Measured").

Under those circumstances, examples 9B and 9C cannot be fairly compared and it cannot be concluded from those examples that they demonstrate the "unique stretch characteristics" put forward in the patent in suit (page 22, line 43; paragraphs 16-18, 54 and 115-118).

In view of the above, the reduction in deformation of the polyamide domains upon stretching in relation to the use of a lithium sulfonate compound instead of a sodium sulfonate claimed by the appellant is rejected.

- 3.3.5 Under those circumstances, the technical problem effectively solved may only be seen as residing in the provision of further cobalt-free polyester compositions comprising dispersed polyamide domains in alternative to those of example 3 of D1A.

#### 3.4 Obviousness

- 3.4.1 The question remains to be answered if the skilled person, desiring to solve the problem identified in section 3.3.5 above, would, in view of the prior art, have modified the disclosure of the closest prior art in such a way as to arrive at the subject matter of operative claim 1.

3.4.2 Considering that D1A itself teaches to use lithium sulfonate compounds as alternative to sodium sulfonates as comonomers reacted into the backbone of the polyester (D1A: page 7, line 21; page 8, line 1), it is obvious to solve that problem by replacing the copolyester comprising sodium sulfonate monomers used as component (C) in the composition of example 3 of D1A by a similar copolyester comprising lithium sulfonate monomers as taught therein.

During the oral proceedings before the Board the appellant argued that the skilled person would not contemplate replacing the copolyester comprising sodium sulfonate monomers used as component (C) in the composition of example 3 of D1A. However, in order to provide a mere alternative to the composition of the closest prior art, the skilled person would contemplate any variation of that embodiment described in D1A as a whole, i.e. including replacing the sodium sulfonate modifier by the lithium sulfonate. The fact that the sodium sulfonate is indicated as a preferred embodiment does not affect that conclusion, since the problem to be solved is to provide a mere alternative. In that respect, it is explicitly stated at page 7, lines 11-13 of D1A that any sulfonic acid metal salt compound represented by the general formula (1) (page 7, line 5 of D1A), i.e. including compounds such as lithium sulfoisophthalic acid, may be used.

3.4.3 It is noted in addition that the subject-matter of granted claim 1 is further characterised by the feature that the average diameter of the dispersed (polyamide) particles should be less than 150 nm and that it could not be ascertained that said feature was satisfied by the composition of example 3 of D1A (see section 3.2.3 above). However, it was neither shown nor argued by the

appellant that said feature played a role in respect of the inventive step. Besides, the composition of example 3 of D1A is prepared according to the teaching of the patent in suit, namely by mere kneading of a non-modified polyester, a polyamide and a polyester modified by reacting a sulfonate component into the backbone of the polyester (see paragraphs 41-43 regarding the nature of the polyamide; paragraphs 22-27 regarding the nature of the polyester; paragraphs 32-35, 46 regarding the nature of the interfacial tension reducing agent and paragraphs 19-21, 28-32, 44 and 55-78 regarding the use of said interfacial tension reducing agent as a comonomer of the polyester; paragraphs 88 to 93 regarding the method of preparation by mere blending of the various components or by other techniques). Therefore, it is to be expected that replacing the sodium sulfonate compound of D1A by the corresponding lithium sulfonate compound must lead to compositions satisfying the requirement in terms of average diameter of dispersed particles defined in granted claim 1, which was not objected to by the appellant.

- 3.5 In view of the above, the subject-matter of granted claim 1 is not inventive in view of the teaching of D1A and the main request is not allowable.

**Auxiliary requests - Inventive step**

4. No additional arguments were put forward by the appellant regarding inventive step in respect of any of auxiliary requests A, 1, 1A, 2 and 2A.
- 4.1 Since claim 1 of auxiliary request A is identical to claim 1 of the main request, the same conclusion regarding inventive step as for the main request is



also valid for auxiliary request A.

4.2 Further considering that the composition of example 3 of D1A already contains

- as component (C) a polyester comprising a sodium sulfonate reacted into its backbone, so that replacing the sodium sulfonate by a lithium sulfonate as contemplated for the main request will lead to a polyester fulfilling the condition of the amendment made in claim 1 of auxiliary requests 1, 1A, 2 and 2A, and
- as component (B) a polyamide which is not derived from hexamethylene diamine (but from m-xylylene diamine), i.e. corresponding to a polyamide defined taking into account the amendment made in the definition of group D in claim 1 of auxiliary requests 2 and 2A,

the amendments made in claim 1 of each of auxiliary requests 1, 1A, 2 and 2A do not introduce any further difference with respect to example 3 of D1A and therefore do not contribute to an inventive step. On that basis, the same conclusion regarding inventive step is bound to be reached for each of those requests as for the main request.

4.3 Therefore, none of auxiliary requests A, 1, 1A, 2 and 2A may overcome the objection of lack of inventive step retained against the main request.

5. In view of the conclusion reached in section 4.3 above, there is neither need for the Board to decide on the admittance into the proceedings of any of auxiliary requests A, 1A, 2 and 2A (which was objected to), nor

to deal with any other issues in dispute between the parties.

**Order**

**For these reasons it is decided that:**

The appeal is dismissed.

The Registrar:

The Chairman:



L. Stridde

D. Semino

Decision electronically authenticated