

**Internal distribution code:**

- (A) [ ] Publication in OJ  
(B) [ ] To Chairmen and Members  
(C) [X] To Chairmen  
(D) [ ] No distribution

**D E C I S I O N**  
**of 6 September 2005**

**Case Number:** T 0599/03 - 3.3.03

**Application Number:** 92922401.2

**Publication Number:** 607342

**IPC:** C08L 23/08, C08F 210/16,  
C08J 5/18

**Language of the proceedings:** EN

**Title of invention:**  
Polyethylene films exhibiting low blocking force

**Patentee:**  
The Dow Chemical Company

**Opponent:**  
Borealis Polymers OY

**Headword:**  
-

**Relevant legal provisions:**  
EPC Art. 54, 56

**Keyword:**  
"Novelty (yes)"  
"Novelty - prior disclosure - implicit feature (no)"  
"Inventive step - (yes)"

**Decisions cited:**  
T 0686/91, T 0793/93, T 0644/97

**Catchword:**  
-



Case Number: T 0599/03 - 3.3.03

**D E C I S I O N**  
of the Technical Board of Appeal 3.3.03  
of 6 September 2005

**Appellant:** Borealis Polymers OY  
(Opponent) P.O. Box 330  
FI-06101 Porvoo (FI)

**Representative:** Kador + Partner  
Corneliusstrasse 15  
D-80469 München (DE)

**Respondent:** The Dow Chemical Company  
(Proprietor of the patent) 2030 Dow Center  
Midland, MI 48674 (US)

**Representative:** Smulders, Theodorus  
Vereenigte  
Postbus 87930  
NL-2508 Den Haag (NL)

**Decision under appeal:** Decision of the Opposition Division of the  
European Patent Office posted 1 April 2003  
rejecting the opposition filed against European  
patent No. 607342 pursuant to Article 102(2)  
EPC.

**Composition of the Board:**

**Chairman:** R. Young  
**Members:** M. Gordon  
E. Dufrasne

## Summary of Facts and Submissions

- I. Mention of the grant of European Patent No. 0 607 342 in respect of European patent application No. 92922401.2 in the name of The Dow Chemical Company was announced on 18 November 1998 (Bulletin 1998/47) on the basis of 12 claims.

Independent claims 1, 10, 11 and 12 read as follows:

"1. A film having a blocking force of about 30 grams or less without antiblock additives therein consisting essentially of a thermoplastic ethylene interpolymer product which is a composite or blend of a first interpolymer of ethylene and at least one alpha-olefin and at least one other interpolymer of ethylene and at least one alpha-olefin, wherein the at least one other interpolymer has a different average molecular weight than the first interpolymer, the composite or blend being characterized as having,

- a) a melt flow ratio,  $I_{10}/I_2$ , of from about 8 to about 30,
- b) a density of about 0.935 grams/milliliter or less, and
- c) a high molecular weight component or fraction defined as at least about 0.5 percent by weight of the composite or blend having a weight average molecular weight of at least about 1,000,000 grams/mole.

10. A multilayer film structure having at least one outer layer being a film of any one of the claims 1-9.

11. A method of preparing a film having a blocking force of about 30 grams or less without adding antiblock agents added therein, comprising the steps of:

- a) polymerizing ethylene in at least one higher molecular weight zone of a reactor at temperatures and pressures sufficient to produce a first polymer,
- b) interpolymerizing ethylene and at least a first alpha-olefin in at least one other zone of a reactor at temperatures and pressures sufficient to produce a first interpolymer having a lower molecular weight than the first polymer,
- c) combining from 0.5 percent and up to 50 percent of the first polymer of a) with the first interpolymer of b) to form a composite or blend so that the composite or blend has a melt flow ratio,  $I_{10}/I_2$ , of from about 8 to about 30, a density of about 0.935 grams/milliliter or less, and a high molecular weight component or fraction defined as at least about 0.5 percent by weight of the composite or blend having a weight average molecular weight of at least about 1,000,000 grams/mole, and
- d) extruding the composite or blend product of (c) into a film.

12. A sack produced from the film of claim 1, or from the film prepared in the method of claim 11."

II. A Notice of Opposition was filed on 17 August 1999 by Borealis Polymers OY (OI).

The Opponent requested revocation of the patent in its entirety on the grounds of Article 100(a) EPC, in

particular on the grounds of lack of novelty (Article 54 EPC) and lack of inventive step (Article 56 EPC).

III. The following documents were cited in support of the opposition:

- EP-A1-0 435 624 (D1);
- An experimental report by Mr Hannu Salminen dated 13 August 1999 filed together with the Notice of Opposition, containing a repetition of example 2 of D1;
- a later filed, but admitted further experimental report ("Testimonial") by Mr Salminen, dated 3 April 2002, filed with a letter of 10 April 2002 containing a repetition of example 1 of D1.

By its decision announced orally on 12 November 2002 and issued in writing on 1 April 2003, the opposition division rejected the opposition.

The opposition division held that the subject matter claimed was novel as the Opponent had not demonstrated that the procedure adopted in the two experimental reports was clearly and unambiguously derived from D1.

Regarding inventive step, the technical problem was formulated as to provide polyethylene films with low blocking force and low coefficient of friction without requiring any additives, and also to avoid the cost and drawbacks related to addition of additives into LLDPE. It was held that the argument of the Opponent that it would have been obvious to measure the blocking force of the films of D1 did not render the films of the patent in suit obvious. It was held that a low blocking force could not be derived from the prior art according

to D1 in an obvious manner, and hence there was no incentive to consider the combination of properties as defined in claim 1 in the claimed range of values.

IV. A notice of appeal against this decision was filed on 27 May 2003, the requisite fee being paid on the same day. The statement of grounds of appeal was received on 6 August 2003. Six additional documents, identified as D2-D7, were cited.

The Appellant filed a further submission on 4 August 2005 together citing a further three documents, identified as D8-D10, *inter alia*:

D9: "Kunststoff-Handbuch", Vol. IV; "Polyolefine", Carl Hanser Verlag, 1969, pp 64-78, 204, 205 and

D10: WO 91/07443.

The arguments presented by the Appellant in the written submissions above, may be summarised as follows:

(a) Novelty

(i) D1 anticipated the subject matter of claims 1 and 11 of the patent. As shown in the Testimonial of 3 April 2002 example 1 of D1 had been repeated. The instructions of D1 had been followed, which instructions were sufficiently detailed.

(ii) It was not necessary for D1 to describe the polymerisation procedure - it was sufficient to define the components and the final

products by their physical properties. Even a few of the physical properties were sufficient to specifically describe the polymers of D1. The properties reported in example 1 of D1 were also sufficiently defined to make it possible to conclude that the material prepared in the Testimonial was the same as that of example 1 of D1.

- (iii) The production of such polymers, the polymerization conditions and catalysts were well known in the art. Regarding the catalysts, this general knowledge was witnessed by D9. The catalyst of D10, example 4 fulfilled all the requirements set out in D9. The skilled person was able to produce the polymers of D1 by selecting a catalyst such as that of example 4 of D10 and controlling the melt index and density by the amounts of comonomer and hydrogen employed.
  
- (iv) The properties of each of the two components of the polymers employed in the Testimonial (density, melt index) were identical to those reported in D1 within the limits of experimental accuracy. The "melt index corrected density" was not given in the Testimonial but could be calculated from the respective values of  $I_2$ . As it was not possible to measure  $I_2$  for the high molecular weight component due to the high viscosity thereof, it was necessary to calculate this from the value determined for

$I_{21}$ , and the assumed ratio of  $I_{21}/I_2$ , derivable from D10, example 4.

- (v) The properties of the final polymer blend according to the patent in suit - density,  $I_{21}$  melt index and melt flow ratio could be regarded as the same as example 1 of D1, within experimental error.
- D1 and the patent specified different measurements of melt flow ratios -  $I_{21}/I_2$  and  $I_{10}/I_2$  respectively, but after having prepared the polymer according to example 1 of D1 in the Testimonial, the melt flow ratio  $I_{10}/I_2$  had been determined. The determination of  $I_2$  was problematic when the value was very small, but considering the values of  $I_{10}$  and  $I_2$  determined in the Testimonial, the ratio  $I_{10}/I_2$  would remain in the scope of claim 1 of the patent in suit unless the error in measuring  $I_2$  was greater than 50%, which was considered unlikely. The Appellant pointed out that determination of  $I_2$  of the high molecular weight component was also a problem in the patent in suit.
- (vi) The proportion of polymer with molecular weight above 1,000,000, which parameter was not explicitly disclosed in D1, had been determined, according to the Testimonial, to be in the range required by claim 1.
- (vii) The blocking force had been measured and found, according to the Testimonial, to be within the limit set by claim 1.



(viii) As the determined values of these parameters were well within the limits of claim 1, even high measurement uncertainties would not render the reproduced example outside the scope of the claim.

(ix) The fact that certain parameters defined in the claims of the patent in suit - in particular low blocking force - were not explicitly disclosed in D1 could not establish novelty, since the evidence showed that this parameter was inevitably obtained in repeating example 1 of D1.

(b) Inventive Step

The technical problem as formulated by the opposition division was adopted. D1 was a relevant starting point as it dealt with high strength films which met Food and Drug Administration (FDA) requirements, which characteristics were important for use in grocery sacks. It was submitted, with reference to the six newly filed documents, that in seeking to solve this problem the skilled person would seek films based on broad molecular weight distribution polyethylene, or hazy films since it was generally known that blocking resistance and haze were antagonistic properties. Even though D1 made no reference to blocking force, nothing would impede the skilled person from investigating the anti-blocking properties of these materials. The skilled person would have followed the teaching of D1, varying the

polymerisation conditions and catalysts within the usual ranges and investigated the properties of the obtained films. It would have been found that all the films consisting essentially of these polymers inevitably exhibited a low blocking force.

V. In letters dated 27 February 2004 and 5 August 2005, the Respondent argued essentially as follows:

(a) Novelty

The procedures employed in D1 were not particularly elaborated, and there was no detailed description of preparation or blending of the two components, making it difficult reliably to reproduce the examples. In particular the catalyst, the type of polymerisation and the reaction conditions were not specified in the example. Certain properties of the composition disclosed in D1, in particular the  $I_2$  of component 1 in example 1 had not been measured. Measurement of the melt flow ratio thus could not be considered reliable due to uncertainty in determination of the value under low load ( $I_2$ ). Consequently it was impossible to calculate the "melt index corrected density" for this component. Due to these uncertainties it was disputed that the blend was a reproduction of example 1 of D1.

(b) Inventive step

Regarding inventive step, the Respondent first objected to the introduction of new documents. It was further argued that the fraction of polymer

with molecular weight above 1,000,000 and not a broad molecular weight distribution was the reason that a low blocking force was obtained.

VI. Oral Proceedings was held before the Board on 6 September 2005.

(a) With regard to novelty, the Appellant argued essentially as follows:

(i) Three features defined in the claims of the patent in suit were not explicitly disclosed in D1:

- the ratio of  $I_{10}/I_2$  (Melt flow ratio)
- fraction with a molecular weight of at least 1,000,000
- the blocking force;

whereby D1 reported a different melt flow ratio measurement ( $I_{21}/I_2$ ); the content of polymer with molecular weight  $>1,000,000$  was an arbitrary parameter, and it was impossible to find any document disclosing this; the blocking force was a parameter rarely used in polymer films. The only way to establish that D1 anticipated the subject matter claimed was to replicate the teaching thereof.

(ii) It was not possible clearly to deduce which catalyst had been used in D1. It was assumed that the author of D1 had employed a catalyst similar to that of D10.

- (iii) It was emphasised that in carrying out the repetition of example 1 of D1 the requirement was to show that the composition so prepared exhibited parameters falling within the scope of claim 1 of the patent in suit, but it was not necessary to show that the product fulfilled all the parameters listed for the product in D1. It was assumed that non-measured properties such as tear and impact strength would correspond to the values reported in D1 as these originated from the properties that had been measured.
  
- (iv) All the values measured in the reworked example according to the Testimonial (density, blocking force, melt flow ratio, proportion of polymer with molecular weight above 1,000,000) lay well within the range limits defined by claim 1 of the patent in suit, meaning that variations of the conditions and catalysts employed would still yield products within the scope of the claim.
  
- (v) The high molecular weight component of D1, example 1 (component 1) had a  $I_{21}$  melt flow value of 0.39, which, according to general knowledge, corresponded to a molecular weight of around 500,000. Assuming a molecular weight distribution of around 4, and in view of the Gaussian distribution of molecular weight it was inevitable that a "decent portion" of this component would have a molecular weight above 1,000,000. As

this component was present in a proportion of 65% of the total, there would always be a proportion of polymer with molecular weight >1,000,000 as required by claim 1 of the patent in suit.

- (vi) It was general knowledge that the presence of two components of different molecular weight, (including the very high molecular weight fraction (>1,000,000)) resulted in a rough surface and hence a low blocking force. Thus the blocking force of example 1 of D1 must be less than 30.
- (vii) Regarding the melt index corrected density, the value for  $I_2$  for the low molecular weight component had been measured. It was not possible to determine  $I_2$  for the first component experimentally hence it had been calculated on the basis of general knowledge.

The Respondent submitted:

- (viii) It was not possible to replicate example 1 of D1 since neither the process conditions nor the catalyst employed were disclosed.
- (ix) The statements of the Appellant concerning the molecular weight corresponding to an  $I_{21}$  melt index of 0.39 and the relation between the molecular weight distribution, high molecular weight fraction and surface roughness were disputed.

- (x) D1 contained no information on surface roughness, haze or blocking. Certain properties reported in D1 (impact strength, content of hexane extractables, tear strength) had furthermore not been determined in the repetition by the Appellant.
  
- (xi) With regard to other properties, e.g. the  $I_{21}$ ,  $I_{10}$ , and  $I_2$  melt indices and the ratios thereof it was not sufficient to measure one and calculate the others. The melt index corrected density could not be determined if it was not possible to measure  $I_2$ .
  
- (b) With regard to inventive step, the Appellant submitted as follows:
  - (i) The problem was to provide films of low blocking force. The intended use was in grocery sacks, whereby the low blocking force made them easier to open.
  
  - (ii) D1 was the closest prior art. According to its claim 15 it related to films. Low hexane extractables were reported at page 2, line 27 which according to page 2, lines 13-15 was important for meeting Food and Drug Administration (FDA) requirements, indicating suitability for grocery sacks.
  
  - (iii) With regard to the three features of claim 1 not explicitly disclosed in D1 the Appellant commented:

- the melt flow ratio was simply another expression of the requirement for a broad molecular weight distribution, which was suggested by the title of D1 and exhibited by the examples of D1;
- the proportion of interpolymer with a  $M_w > 1,000,000$  would be greater than 0.5%;
- for three reasons the skilled person would have an incentive to consider the blocking force:
  - the films of D1 were suitable for use in grocery sacks;
  - the hexane extractables content was related to blocking force, and hence the explicitly disclosed value thereof would directly suggest a low blocking force;
  - the skilled person would have been aware that the broad molecular weight distribution and content of high molecular weight component in D1 would have lead to melt flow characteristics which gave rise to a rough surface which in turn would result in low blocking force.

The Respondent submitted as follows:

(iv) D1 could not represent the closest prior art since it focussed on increased strength and did not refer either to blocking force or to grocery sacks.

(v) The relevance of the reference to FDA requirements to the problem of the patent was an assumption, since other reasons for this reference were possible, e.g. use of the films for packaging cheese.

VII. The final requests of the parties were:

Appellant (Opponent): that the decision under appeal be set aside and that the European patent No. 607 342 be revoked;

Respondent (Patentee): that the appeal be dismissed and that the patent be maintained as granted.

### **Reasons for the Decision**

1. The Appeal is admissible.

2. *The Patent in suit*

The patent in suit relates to films from a composite or blend of a first interpolymer of ethylene and at least one  $\alpha$ -olefin and at least one other such interpolymer, which has a different average molecular weight than the first interpolymer. According to claim 1, the films have a blocking force of about 30 grams or less without anti-block additives. The composites or blends from



which the films are prepared have the following features:

- a density of about 0.935 grams/millilitre or less;
- a high molecular weight component or fraction defined as at least about 0.5 percent by weight of the composite or blend having a weight average molecular weight of at least about 1,000,000 grams/mole;
- a melt flow ratio  $I_{10}/I_2$  of from about 8-30;  
(The melt flow ratio indicates the molecular weight distribution as explained at page 4, line 10 of the patent in suit).

The technical problem that the patent set out to solve was to provide a film which had a low blocking force and low coefficient of friction and did not require additives to achieve these properties and a method for preparing said film (page 2, lines 37 and 38 of the patent).

An envisaged use of these films was in grocery sacks (page 2, line 4, page 6, line 41 of the patent).

The examples of the patent show 11 resin blends according to the claims, three comparative blends and blown films prepared therefrom. As shown in Table IV of the patent, the blocking force of all examples according to the claims is in the range of 6.5 to 27.0 g, while that of the three comparative examples is 46.3, 66.5 and 7.5, this last value being obtained in a composition containing added antiblock and slip agents. The examples therefore make it plausible that the

technical problem as defined in the patent is solved by the claimed subject matter.

3. *The Prior art*

EP-A1-435 624 (D1) discloses, according to the title "Broad distribution, high molecular weight low density polyethylene and method of making thereof". According to the first paragraph of the description of D1, the technical problem which is being addressed is to provide low density polyethylenes having a broad molecular weight distribution, excellent strength properties but relatively low level of hexane extractables.

Claim 1 of D1 defines the composition as having a melt flow ratio from 50-250 and a substantially constant melt index-corrected density throughout the molecular weight distribution of the polymer. Claim 7 defines a first process embodiment for producing a polymer having the features required by claim 1 whereby two polymers of different molecular weight (high and low), but the same melt index-corrected density are combined.

According to claim 8, a second process embodiment is provided which involves a two stage polymerisation of olefins or a mixture of olefins using the same or a different catalyst such as a Ziegler-Natta catalyst (discussed in detail in D1 on page 3 from line 56) to yield a product with the features as defined in claim 1.

The compositions are stated to have a low content of hexane extractables, which is necessary to meet Food and Drug Administration (FDA) requirements as explained at page 2, lines 13-15 of D1. The compositions further have excellent strength properties.

According to page 4 line 49, the melt flow ratio is defined as the ratio of the melt flow under high load conditions ( $I_{21}$ ) to that under low load conditions ( $I_2$ ), i.e.  $I_{21}/I_2$ . The "melt index-corrected density" is a derived value. It is explained on page 3 from line 6 that the feature "substantially constant melt index-corrected density" means that the number of short chain branches is substantially constant throughout the polymer and that the high and low molecular weight fractions have substantially the same frequency of branches. The measured density is dependent on the molecular weight and this dependence is eliminated by correcting the density to melt index  $I_2 = 1.0$ . The consequence of this is that the corrected density is only a function of the branch content. Generally, the melt index corrected density is the density that would be obtained if the melt index ( $I_2$ ) of both components was 1.0. The melt index corrected density ( $d_c$ ) is derived by calculation according to the formula:

$$d_c = d - 0.0105 [1 - (I_2)^{-0.28}]$$

wherein (d) is the measured density and the  $I_2$  melt index.

Example 1 discloses a composition which is a blend of two copolymers according to the first embodiment, and example 2 shows a composition according to the second embodiment, derived from a homopolymer. The properties of the copolymer components and the blends thereof, given in the table 1 of D1, are presented below:

<b>Component 1</b>	Ex. 1	Ex. 2
Comonomer	butene	butene

density (g/cc)	0.912	0.912
Melt Index (I <sub>21</sub> g/10 min)	0.39	0.39
Corrected Density (g/cc)	0.937	0.937
Fraction of component 1	0.65	0.66
<b>Component 2</b>		
Comonomer	butene	homopmr
density (g/cc)	0.933	0.97
Melt Index (I <sub>2</sub> g/10 min)	90	105
Corrected Density (g/cc)	0.925	0.962
Fraction of component 2	0.35	0.34
<b>Final Blend</b>		
Density (g/cc)	0*	0.934
I <sub>21</sub> (g/10 min)	4.14	7.01
MFR	122	125
MD Tear (gms)	111	64
Impact (gms)	1390	1280
% hexane extractables	2.63	1.03

*\*The density was not reported in D1. The Appellant calculated this as being 0.919g/cc*

#### 4. Novelty

The Appellant argued, based on the experimental report and the Testimonial filed during the proceedings before the opposition division (Section IV, above), that the composition of examples 1 and 2 of D1 anticipated the subject matter of claims 1 and 11 of the patent in suit.

- 4.1 Example 2 of D1 relates to a blend of a copolymer and a homopolymer whereas claim 1 of the patent in suit requires a blend of two copolymers ("interpolymers"). Accordingly example 2 of D1 relates to a composition

which does not fall within the terms of claim 1 of the patent in suit, and hence is not relevant to the question of novelty. It is further noted that according to the Appellant's report, the composition was prepared by sequential polymerisation in a loop reactor, whereas example 2 of D1 employed dry blending of the components followed by extrusion, so that in any case the experimental report did not represent an accurate repetition of D1 example 2. Consequently, neither example 2 nor its repetition by the Appellant is novelty destroying for the subject matter of claim 1 of the patent in suit.

4.2 Regarding example 1, D1 does not disclose either how the two component polymers were obtained, or the conditions under which these were blended. Further, the following features of claim 1 of the patent in suit are not mentioned in example 1 of D1:

- blocking force;
- $I_{10}/I_2$  melt flow ratio;
- content of fraction with  $M_w$  at least about 1,000,000.

4.3 The Testimonial filed by the Appellant relating to example 1 of D1 reported the following properties:

**High molecular weight component:**

comonomer: Butene

$I_{21}$  0.37 g/10 min

Density 912 kg/m<sup>3</sup> (=0.912 g/cc)

**Low molecular weight component:**

Comonomer: Butene

$I_2$  : 83 g/10 min

Density: 933 kg/m<sup>3</sup> (=0.933 g/cc)

**Final blend and film produced therefrom:**

I <sub>2</sub> :	0.03 g/10 min
I <sub>10</sub> :	0.46 g/10 min
I <sub>21</sub> :	4.2 g/10 min
density:	918 kg/m <sup>3</sup> (0.918 g/cc)
M <sub>w</sub> :	380000 g/mol
M <sub>n</sub> :	16400 g/mol
MWD:	23
Blocking force:	0.0 g

The Testimonial stated that the fraction having a M<sub>w</sub> higher than 1,000,000 was 9 wt%. It was not explained how this was determined.

4.3.1 The Testimonial did not explain the preparation of the two components, or the conditions (additives etc) under which the blending thereof took place nor did the Testimonial report the following features which are disclosed in example 1 of D1:

- the melt index-corrected density of components 1 and 2;
- tear strength;
- impact strength.

4.3.2 Regarding the manner of preparation, the subsequent submission by the Appellant that the conditions employed were those known from D10, example 4 since this procedure met the requirements for Ziegler-Natta catalysts disclosed by the review document D9 is not convincing for the following reasons:

- there is no link between the review document D9 and D10;
- there is no link between patent applications D10 and D1 (different applicants);

- D9 predates D1 and D10 by some 20 years;
- D10 has a publication date of 30 May 1991, i.e. 6 months after the filing date of D1, rendering it questionable whether the authors of D1 could have been aware of the teaching of D10;
- D10 is primarily concerned with a specific manner of preparing the support for a Ziegler-Natta catalyst, making it questionable whether the teaching of this document is representative of Ziegler-Natta catalysts in general, such as taught in D9.

It is therefore concluded that the Appellant has failed to demonstrate that D10 discloses "typical" Ziegler-Natta conditions, and even if it had, that the method selected by the Appellants would necessarily have been employed by the inventors of D1.

4.3.3 Regarding the melt index-corrected density which is an essential feature of D1, to be fulfilled by all the compositions thereof, it is noted that the Testimonial did not report the  $I_2$  value of the high molecular weight component, which is required, according to the formula of D1 (section 3, above) to determine the melt index corrected density. Since D1 also provided no information about the molecular weight of the polymer or about the catalyst or the polymerisation conditions employed, it is impossible even in principle to estimate or infer a value for the melt index corrected density of this component. The Appellant submitted that the value of  $I_2$  could be calculated from the  $I_{21}$  value reported in D1, employing an assumed ratio of  $I_{21}/I_2$  of 30.6, this assumed ratio being derived from example 4 of D10. The value of the melt index-corrected density thus obtained was 0.9377 g/cc. As noted above, however,

it has not been demonstrated that the conditions of D10, example 4 would have been employed by the authors of D1. Further, example 4 of D10 related to a homopolymer, not a copolymer. The Appellant has provided no arguments as to why the ratio obtained would nevertheless be applicable to the case of a copolymer.

It is therefore concluded that the Appellant has failed to demonstrate that the high molecular weight copolymer (component 1) employed for the repetition exhibited the same melt index-corrected density and thus was identical to the corresponding component of D1.

4.3.4 The arguments concerning the melt index-corrected density of the high molecular weight component are not convincing since they are based on unwarranted assumptions as to the relevance of D10, and in any case are not based on the most relevant data from D10.

4.3.5 The question of whether there might be a problem in measuring low values of  $I_2$  in the patent in suit (section IV.(a).v above) is irrelevant to the issue of whether the Testimonial represents a faithful reproduction of example 1 of D1.

4.4 Certain other properties of the compositions disclosed in D1 were in any case not reported in the repetition (tear strength, impact strength, % hexane extractables), meaning that it has not been shown that the material prepared did in fact correspond to that of D1 example 1. It is therefore concluded that the Appellant has failed to demonstrate that the experiment reported in the Testimonial is in fact a correct repetition of example 1 of D1.



4.5 Under circumstances where it is being argued to challenge novelty, as here, that subject matter falling within the terms of the claims under examination is inevitably obtained when following the teaching of a prior art disclosure, the standard of proof of "beyond all reasonable doubt" needs to be applied (T 793/93, 27 September 1995, not published in the OJ EPO, Reasons 2.1). The consequence of this is that if there is any reasonable doubt as to what might or might not be the result of carrying out the literal disclosure and instructions of a prior art document, the case of anticipation based on such a document will fail.

Since the Appellant has failed to demonstrate that example 1 of D1 has in fact been replicated, it has not been shown to the requisite standard of proof that the product of example 1 of D1 would inevitably exhibit the features required by claim 1 of the patent in suit.

4.6 The Appellant further argued that the repetition yielded values of all the required features of claim 1 within the limits defined by the claim so that even high measurement uncertainties would not render the data outside the scope claimed. This argument presupposes that the product against which the comparison is being made does in fact correspond to the teaching of the prior art. However, as noted above, this identity has not been shown so this argument must fail.

4.7 Since the evidence of the Testimonial does not demonstrate that the subject matter of claim 1 is disclosed in example 1 of D1, any further assessment of

novelty can only be based on the remaining written teaching of D1. The subject matter of claims 1, 10, 11 and 12 of the patent in suit is however distinguished from this teaching by the following features:

- Blocking force 30 g or less
- melt flow ratio  $I_{10}/I_2$  from 8-30
- content of high molecular weight fraction of at least 0.5 percent by weight of the composite or blend having a weight average molecular weight of at least about 1,000,000 gram/mole.

4.8 Accordingly, novelty of the subject matter of claims 1, 10, 11 and 12 is acknowledged.

5. *Inventive step*

5.1 The Technical Problem, and its solution

As discussed under section 2, the technical problem that the patent sets out to solve is to provide a film which has a low blocking force and low coefficient of friction and does not require any additives to achieve these properties. As noted, it is apparent that this problem has in fact been solved by the claimed subject matter.

5.2 The closest prior art

5.2.1 The document cited by the Appellant as closest prior art, D1, does not make any mention of blocking force or coefficient of friction. Rather, it is concerned with providing materials of high strength and low hexane extractables. This low content of hexane extractables

is required to meet FDA requirements. There is no mention in D1 of grocery sacks.

- 5.2.2 According to the Case Law of the Boards of Appeal, the document selected as closest prior art must be a document which discloses subject matter conceived for the same purpose, or which is aiming at the same objective as the claimed invention and having the most relevant technical features in common (see "Case Law of the Boards of Appeal of the European Patent Office", 4th Edition, 2001, section I.D.3). In determining the closest state of the art, *ex post facto* considerations are to be avoided, so that a document not mentioning a technical problem that is at least related to that problem derivable from the patent does not normally qualify as a description of the closest state of the art, regardless of the number of technical features it might have in common with the subject matter (T 686/91, 30 June 1994, not published in the OJ EPO, Reasons, point 4).
- 5.2.3 The problem which D1 set out to solve is as noted under section 3 above. D1 makes no reference to low blocking force or to grocery sacks. While arguably the indication of satisfying FDA requirements suggests that the products of D1 may be suitable for use in food related applications, no such use, even in general terms, is disclosed or suggested. Even if it were to be accepted that a statement that FDA requirements in general were met was to be equated with suitability for food use, this would still not provide a direct indication of a low blocking force or low coefficient of friction; as argued by the Respondent, food related uses exist where low blocking force is not required e.g.

wrapping of cheese. It is also not the case that the Appellant has demonstrated a *prima facie* link between meeting FDA requirements and blocking force. It is also the case that D1 fails to teach, even implicitly, the existence of any relationship between properties of the polymers thereof, e.g. the breadth of the molecular weight distribution and the blocking force. Any link between these two properties becomes apparent only in the knowledge of the teaching of the patent in suit. Accordingly, D1 contains no mention of any technical problem that is related to that underlying the patent in suit.

- 5.3 The situation in which, as in the present case, the document cited as "closest state of the art" concerns a problem which is not closely oriented to that of the claimed subject matter was the subject of decision T 644/97 (22 April 1999, not published in the OJ EPO). According to point 2.6 of the reasons of this decision, it is necessary in such a situation to reflect this lack of orientation in the formulation of the technical problem, giving rise to a formulation such as "The provision of a further composition with a different spectrum of utility". This statement of problem however lacks any convergent aim which deprives it of a basis for proposing any measure for modification to achieve such an aim. There would also be no incentive to combine such a disclosure with any other document that did relate to the technical problem underlying the patent in suit since the relevance of such disclosure would not be apparent. It was thus concluded in T 644/97 (Reasons 2.6.4) that:

"In summary, the technical problem arising from a "closest state of the art" disclosure which is irrelevant to the claimed subject-matter in the sense that it does not mention a problem that is at least related to that derivable from the patent specification has a form such that its solution can practically never be obvious, because any attempt by the skilled person to establish a chain of considerations leading in an obvious way to the claimed subject-matter gets stuck at the start. It follows that the respective claimed subject-matter is non-obvious in the light of such art."

- 5.4 Applying the findings of T 644/97 to the present case, it is concluded that in view of the absence from D1 of any reference to a problem at least related to obtaining low blocking force and low coefficient of friction, it can provide no indications to the technical problem underlying the patent in suit and hence cannot provide a valid starting point to demonstrate that the subject matter claimed is obvious.
- 5.5 Accordingly the subject matter of claims 1, 10, 11 and 12 involves an inventive step starting from D1 as the closest state of the art.
- 5.6 Since no other document has been presented as an alternative closest state of the art, the conclusion is that the subject matter of claims 1, 10, 11 and 12 involves an inventive step within the meaning of Article 56 EPC.
6. The six additional documents (D2-D7) filed with the Statement of Grounds of Appeal and the document D8 filed with the submission of the Appellant dated

4 August 2005 are not relevant to the decision to be taken, and therefore pursuant to Article 114(2) the Board has decided not to admit these to the procedure.

**Order**

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

The appeal is dismissed.

The Registrar:

The Chairman:

E. Görgmaier

R. Young