

**Internal distribution code:**

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

**Datasheet for the decision  
of 15 March 2011**

**Case Number:** T 0642/08 - 3.3.09

**Application Number:** 99917109.3

**Publication Number:** 1084035

**IPC:** B32B 27/36

**Language of the proceedings:** EN

**Title of invention:**

Heat-shrinkable multilayer film

**Patentee:**

Kureha Corporation

**Opponent:**

Cryovac, Inc.

**Headword:**

-

**Relevant legal provisions:**

EPC Art. 54, 56, 84, 123(2)

RPBA Art. 13(1)(3)

**Relevant legal provisions (EPC 1973):**

-

**Keyword:**

"Main request: late-filed objections - admissible (no)  
late-filed document - admissible (yes)  
inventive step (no)"

"Late-filed auxiliary requests A, B: admissible (no)"

"Late-filed auxiliary request C: admissible (yes)  
inventive step (yes)"

**Decisions cited:**

-

**Catchword:**

-



Case Number: T 0642/08 - 3.3.09

**D E C I S I O N**  
of the Technical Board of Appeal 3.3.09  
of 15 March 2011

**Appellant:** Cryovac, Inc.  
(Opponent) 100 Rogers Bridge Road, Building A  
Duncan, South Carolina 29334-0464 (US)

**Representative:** UEXKÜLL & STOLBERG  
Patentanwälte  
Beselerstraße 4  
D-22607 Hamburg (DE)

**Respondent:** Kureha Corporation  
(Patent Proprietor) 3-3-2, Nihonbashi-Hamacho, Chuo-ku  
Tokyo 103-8552 (JP)

**Representative:** du Pont, Jeroen  
Exter Polak & Charlouis B.V. (EP&C)  
P.O. Box 3241  
NL-2280 GE Rijswijk (NL)

**Decision under appeal:** Interlocutory decision of the Opposition  
Division of the European Patent Office posted  
30 January 2008 concerning maintenance of  
European patent No. 1084035 in amended form  
(Articles 102(3) and 106(3) EPC).

**Composition of the Board:**

**Chairman:** W. Sieber  
**Members:** N. Perakis  
K. Garnett  
W. Ehrenreich  
R. Menapace

## Summary of Facts and Submissions

- I. Mention of the grant of European patent No 1 084 035 in respect of European patent application No 99917109.3 in the name of KUREHA KAGAKU KOGYO KABUSHIKI KAISHA, which had been filed as international application No. PCT/JP1999/002150 on 22 April 1999, was published on 13 July 2005 (Bulletin 2005/28). The patent was granted with 27 claims, independent Claims 1 (product) and 15 (process of manufacture) reading as follows:

"1. A heat-shrinkable multilayer film, comprising at least three layers including an outer surface layer (a) comprising a polyester resin, an intermediate layer (b) comprising a polyamide resin, and an inner surface layer (c) comprising a sealable resin; said multilayer film exhibiting a heat-shrinkage stress at 50°C of at most 3 MPa both in longitudinal direction and in transverse direction, and a hot water shrinkability at 90°C of at least 20%."

"15. A process for producing a heat-shrinkable multilayer film, comprising the steps of:

co-extruding at least three species of melted thermoplastic resins to form a tubular product comprising at least three layers including an outer surface layer (a) comprising a polyester resin, an intermediate layer (b) comprising a polyamide resin and an inner surface layer (c) comprising a sealable resin, cooling with water the tubular product to a temperature below a lowest one of the melting points of the polyester resin, the polyamide resin and the sealable resin constituting the layers (a), (b) and (c),

re-heating the tubular product to a temperature which is at most the lowest one of the melting points of the polyester resin, the polyamide resin and the sealable resin constituting the layers (a), (b) and (c), vertically pulling the tubular product while introducing a fluid into the tubular product to stretch the tubular product at a ratio of 2.5-4 times both in a vertical direction and in a circumferential direction, thereby providing a biaxially stretched tubular film, folding the tubular film, again introducing a fluid into the folded tubular film to form a tubular film, heat-treating the tubular film from its outer surface layer (a) with steam or warm water at 60-98°C, and cooling the heat-treated tubular film to provide a biaxially stretched film exhibiting a heat-shrinkage stress at 50°C of at most 3 MPa both in longitudinal direction and transverse direction, and a hot water shrinkable at 90°C of at least 20%."

II. The opponent, Cryovac Inc., requested revocation of the patent in its entirety on the ground that the subject-matter of the claims as granted lacked novelty (in part because of an alleged prior use) and did not involve an inventive step (Article 100(a) EPC). Together with the notice of opposition, the opponent *inter alia* filed the following documents:

D4: EP-B1-0 476 836;

D5: WO 96/18501 and

D10: EP-A2-0 729 900.

Document D19 was filed after expiry of the time limit set in Article 99(1) EPC:

D19: US-A-4 560 520.

The proprietor *inter alia* filed the following documents:

D14: Affidavit of Mr Uehara dated 24 October 2006; and

D20: Affidavit of Mr Uehara dated 8 August 2007.

III. In its interlocutory decision announced orally on 21 November 2007 and issued in writing on 30 January 2008 the opposition division held that the subject-matter of Claim 1 of the main request (claims as granted) was not novel over D4 and that Claim 1 of Auxiliary Request 1A did not meet the requirements of Article 123(2) EPC. However, Claims 1 to 15 according to Auxiliary Request 1C (filed during the oral proceedings held before the opposition division on 21 November 2007), i.e. the only further request on file, met the requirements of the EPC.

Claim 1 of Auxiliary Request 1C read as follows:

"1. A **tubular** heat-shrinkable multilayer **packaging** film, comprising at least three layers including an outer surface layer (a) comprising a polyester resin, an intermediate layer (b) comprising a polyamide resin, and an inner surface layer (c) comprising a sealable resin; said multilayer film **being in the form of a roll and** exhibiting a heat-shrinkage stress at 50°C of at most 3 MPa both in longitudinal direction and in transverse direction, and a hot water shrinkability at 90°C of at least 20%."

*(Emphasis added by the board highlighting the features introduced into granted Claim 1)*

Claim 15 corresponded to granted Claim 15.

The opposition division considered that the subject-matter of independent product Claim 1 and independent process Claim 15 was novel and involved an inventive step having regard to the cited prior art. As regards inventive step, D4 was considered to represent the closest state of the art from which the tubular multilayer film of Claim 1 differed in that it had a heat-shrinkage stress at 50°C of at most 3 MPa both in longitudinal and transverse direction. A skilled person starting from D4 and aiming at a tubular multilayer film which did not produce any distortion during packaging (the objective technical problem) would not find any hint in the available state of the art (*inter alia* D5 and D10) to the claimed solution. Similar considerations applied to Claim 15 directed to a process for producing a tubular, heat-shrinkable multilayer film having reduced shrink stress.

Documents D19 and D20 were not admitted into the proceedings, because they were considered as *prima facie* not relevant (see appealed decision, page 17, point VI).

- IV. The opponent (appellant) filed an appeal against the decision of the opposition division on 28 March 2008 and paid the appeal fee on the same day.
  
- V. The statement setting out the grounds of appeal was filed on 30 May 2008. In this statement reference was made not only to documents D1-D20 filed during the

proceedings before the opposition division but also to new documents D21-D23.

The appellant maintained the view that the subject-matter of independent Claims 1 and 15, found allowable by the opposition division, lacked any inventive merit over the disclosure of D4 in combination with D5 or D10. Alternatively, the subject-matter of Claim 1 was not inventive with respect to what was made available by the prior use. In this context, the appellant requested that the opposition division's decision in respect of the public prior use be reviewed.

- VI. In its response dated 23 October 2008 the proprietor (respondent) essentially defended the decision of the opposition division.
- VII. In a communication issued on 1 December 2010 the board indicated that the only issue to be discussed at the oral proceedings scheduled for 15 March 2011 appeared to be inventive step. In this context, D4 appeared to be the closest prior art, whereas the allegedly publically available film seemed to be less relevant. In its provisional non-binding opinion the board indicated that the claimed subject-matter was not obvious from D4 in combination with either D5 or D10.
- VIII. On 15 February 2011 the appellant submitted additional arguments concerning the alleged lack of inventive step, and filed the following new document:

D24: US-A-3 551 540.



It argued that the subject-matter of Claim 1 lacked an inventive step in view of the combination of D4 with D24.

- IX. By letter dated 15 February 2011 the respondent filed an auxiliary request.
- X. Oral proceedings were held on 15 March 2011 before the board. During these oral proceedings the appellant raised for the first time objections against the claims as maintained by the opposition division under Articles 123(2), 84 and 54 EPC. The respondent objected to the admissibility of these objections. The respondent further requested that the board considers late-filed document D24 to be inadmissible. During the oral proceedings the respondent withdrew the auxiliary request on file and submitted Auxiliary Requests A, B and C. The appellant requested that Auxiliary Requests A and B be not admitted into the proceedings.

After the board had informed the parties that only Auxiliary Request C would be admitted into the proceedings, the respondent filed a written statement and requested that it be included in the minutes of the oral proceedings. Its text is reproduced under point 6.1, below.

- XI. The appellant (opponent) requested that the decision under appeal be set aside and that the European patent No. 1084035 be revoked.

The respondent (patent proprietor) requested that the appeal be dismissed (main request), alternatively that the decision under appeal be set aside and that the

patent be maintained on the basis of Auxiliary Requests A, B or C filed during the oral proceedings.

XII. The relevant arguments put forward by the appellant in its written submissions and at the oral proceedings may be summarised as follows:

Main Request

- As regards the claims allowed by the opposition division, the limitation in Claim 1 to "tubular" and "being in the form of a roll" did not find proper support in the originally filed application and thus did not meet the requirements of Article 123(2) EPC.
  
- The heat-shrinkage stress was measured on a sample of the film which had been kept in the form of a roll. It was, however, apparent from the respondent's own document D14 that, depending on the time interval between the cutting of the sample and the actual measurement of its heat-shrinkage stress, the value of this parameter could change dramatically. Since this criterion for the measurement was neither defined in a standard method nor in the claim nor in the patent specification, the claimed subject-matter lacked clarity (Article 84 EPC).
  
- The film of Claim 1 lacked novelty over the disclosure of D4. Example 1 of this document related to a tubular multilayer film with a structure and a hot water shrinkability at 90°C falling within the scope of Claim 1. Though D4 did

not disclose any heat-shrinkage stress value, the film of Example 1 of D4 could be considered to have a value falling in the range of up to 3 MPa. This consideration was based on the fact that the disclosed film was very similar to the film of Comparative Example 10 of the patent in suit, whose heat-shrinkage stress in the orthogonal directions was 2.6 and 3.4 MPa. The value of 3.4 MPa fell within the claimed range of at most 3 MPa, because the skilled person would have rounded it down to 3 MPa in view of the precision attributed to this parameter in the claim (i.e., 3 MPa rather than 3.0 MPa).

- In any case, the subject-matter of Claim 1 was not based on an inventive step having regard to the combination in an obvious way of D4 with D24. The appellant considered D4 to represent the closest state of the art, from which the claimed film differed only in a heat-shrinkage stress at 50°C of at most 3 MPa in both the longitudinal and transverse directions. Starting from D4, the technical problem had to be seen in the provision of a heat-shrinkable film which would not cause any distortion of the packaged product when used in shrink packaging applications. A skilled person starting from D4 and trying to solve this problem would consider the general concept disclosed in D24 of independently controlling (i) the shrink tension (i.e., heat-shrinkage stress) in both orthogonal directions and (ii) the free shrink (i.e., hot water shrinkability) and would arrive at the claimed subject-matter without involving an inventive step.

- Regarding the admissibility of late-filed D24, it argued as follows: D24 was filed as a reaction to the provisional opinion of the board on the non-obvious combination of D4 with either D5 or D10 or even D19. The line of argument using D24 remained the same because D4 was to be combined with D24. In fact D24 was highly relevant because it disclosed the concept of independently controlling the shrink tension in both orthogonal directions and the free shrink. The reduction of the shrink tension was achieved by annealing (heat-treatment). Low shrink tension values were particularly desirable when this film was intended to be used for packaging. The disclosed concept of heat-treating the film in order to reduce the shrink tension was not limited to one type of film or to monolayer films.

#### Auxiliary Requests A and B

- Auxiliary Requests A and B should not be admitted in the proceedings. They were late-filed and contained a product claim in a product-by-process form which did not *prima facie* overcome the lack of inventive step objection raised against the product of Claim 1 of the main request. As pointed out by the board, there was no basis in the patent in suit for a technical difference between the film of Claim 1 of the main request and the film of Claim 16 of Auxiliary Request A or the film of Claim 1 of Auxiliary Request B (these two claims being identical).

- In addition, Auxiliary Request A was *prima facie* not admissible because the film of Claim 1, having a printed pattern on the outer surface layer (a), would have been obvious to the skilled person. The arguments set out against the patentability of Claim 1 of the main request applied equally to the film of Claim 1 of this request since the printed pattern on the outer surface of the tubular film was an ordinary feature in the art and thus would have been obvious to the person skilled in the art.

#### Auxiliary Request C

- The appellant raised no objection against the introduction of Auxiliary Request C into the proceedings.
- However, the subject-matter of the sole claim of Auxiliary Request C, which was identical to process Claim 15 as granted, did not involve an inventive step. The claimed process resulted from the combination in an obvious way of D4 with either D5 or D19.
- Document D4 should be considered to represent the closest state of the art. The claimed process differed from it in that it comprised heat-treating the biaxially oriented film from its outer surface layer (a) with steam or warm water at 60-98°C. The technical problem to be solved was the provision of a process for reducing the heat-shrinkage stress of a biaxially oriented film without impairing its free shrink (i.e., hot water shrinkability) properties.

- The skilled person departing from D4 and intending to solve this technical problem would find in either D5 or D19 the motivation to heat-treat the biaxially oriented film and would thus come to the claimed subject-matter without an inventive step. D5 disclosed the heating of biaxially oriented films to 70-100°C for a short time using any conventional technique in order to reduce heat-shrinkage stress. D19 disclosed various conventional methods for the heat treatment of biaxially oriented tubular films based on polyamides which gave the same results. Among them figured the heat treatment with hot water or steam at a temperature of at least 90°C but not exceeding 100°C, which treatment was used to obtain a controlled shrink of the tubular film.

XIII. The arguments put forward by the respondent in its written submissions and at the oral proceedings can be summarised as follows:

Main Request

- The objections under Articles 123(2), 84 and 54 EPC, raised by the appellant for the first time during the oral proceedings before the board, were not *prima facie* relevant and should not be admitted into the proceedings.
- This notwithstanding, the subject-matter of Claim 1 of the main request was directly and unambiguously derivable from the originally filed application (page 21, line 8 to page 23, line 16; Figure 1) and thus satisfied the requirements of Article 123(2) EPC.

- The claimed subject-matter was also clear as regards the value for the heat-shrinkage stress, because it would be clear to a skilled person that the measurement of this property should be carried out as swiftly as possible in order to avoid degradation of the film's properties. Otherwise, the measurement would not represent the property of a multilayer film being in the form of a roll.
  
- The tubular multilayer film of Claim 1 was novel over Example 1 of D4. Despite the fact that this example was very similar to Comparative Example 10 of the contested patent, it differed from it regarding the chemical nature of each individual film layer. Thus Example 1 was not identical with Comparative Example 10. Moreover, this comparative example fell outside the scope of Claim 1.
  
- In this context, the respondent argued that the claimed value of 3 MPa really meant 3.0 MPa, and thus excluded values such as 3.4, contrary to the appellant's allegation. This interpretation of the claim was based on the whole of the description, in particular the examples.
  
- Late-filed document D24 should not be admitted into the proceedings, because it was *prima facie* irrelevant to the issue of inventive step. This single patent document could not be considered to illustrate the common general knowledge of the skilled person at the priority date of the opposed patent. Moreover its disclosure was limited to the control of the shrink properties of only certain

plasticized materials in monolayer films and its teaching could not be generalised to the claimed films without involving hindsight.

- For the assessment of inventive step, D4 should be considered to represent the closest state of the art. The skilled person starting from the tubular multilayer film of D4 and wishing to improve its packaging properties - this improvement constituting the technical problem to be solved - would find no indication in the art how to resolve this problem or any motivation to control the shrink properties as set out in Claim 1.

#### Auxiliary Requests A and B

- Auxiliary Requests A and B should be admitted into the proceedings. These requests contained product claims resulting from the combination of Claims 1 and 14 of the main request and/or the introduction of the process features of Claim 15 of the main request.

#### Auxiliary Request C

- The sole claim of this auxiliary request corresponded to Claim 15 as granted. The subject-matter of this claim was inventive over the cited state of the art. The arguments of the appellant were based on an *ex post facto* analysis.
- D4 should be considered to represent the closest state of the art. It did not disclose the heat-treatment of the biaxially oriented tubular



multilayer film. D5 did not disclose the step of heat treating the tubular film from its outside surface with steam or water at 60-98°C. D5 disclosed heat treatment with heating rollers, the application of which to the tubular film of D4 would inevitably result in non-uniform heat conduction to the superposed film layers and would not uniformly reduce the film's biaxial heat-shrinkage stress while retaining its biaxial heat shrinkability. D19 disclosed the heat treatment with water or steam at 90-150°C for at least 20 seconds. The skilled person would not be motivated to incorporate the heat treating step of D19 in the process of D4 because the disclosed duration of the treatment step would lead to a loss of heat shrinkability. Since retaining the heat shrinkability was not the intention of D19, this document did not provide any hint as to how to produce a heat shrinkable film with the specific laminated structure as claimed.

### **Reasons for the Decision**

1. The appeal is admissible.

#### *Main Request*

2. Admissibility of objections raised at the oral proceedings before the board

The appellant raised objections under Articles 123(2), 84 and 54(2) EPC against Claim 1 as maintained by the opposition division for the first time during the oral proceedings held before the board. However, in the

exercise of its discretion under Article 13(1) and (3) RPBA, the board did not admit these objections into the proceedings because they were *prima facie* not relevant for the following reasons:

2.1 The limitations introduced into Claim 1 during the opposition proceedings, namely that the film is "tubular", is a "packaging" film and is "in the form of a roll", are clearly and unambiguously derivable from the originally filed application (page 21, line 8 to page 23, line 16; Figure 1). Hence, the claimed subject-matter does not *prima facie* infringe the requirements of Article 123(2) EPC.

2.2 According to the appellant, the amendment that the film is "in the form of a roll" led to a lack of clarity as regards the measurement of the heat-shrinkage stress. D14 provided evidence that the actual value of this parameter changed with time. Thus, an indication of the time interval between the taking of the sample from the film roll and the actual measuring of the parameter was crucial in order to obtain reliable and reproducible values for the heat-shrinkage stress. Since the time interval was neither indicated in the claim nor in the patent specification, the claim was unclear.

However, in the board's view, a person skilled in the art wishing to measure the heat-shrinkage of a rolled film would, after having cut a sample of film from it, perform the appropriate measuring method (such method being clearly disclosed in the patent specification: paragraph [0052]) as swiftly as possible in order to minimize the film degradation shown by D14 (Table 2;

Photos A2). On that basis, the claimed subject-matter is not *prima facie* unclear.

- 2.3 The subject-matter of Claim 1 of the main request is also *prima facie* novel over Example 1 of D4. Although the tubular film of Example 1 of D4 might be very similar to the film of Comparative Example 10 of the patent in suit, the layers involved in the structure of the respective multilayer film are chemically different. Thus, the novelty objection is based on "similarity" and therefore is *prima facie* not well founded.

In this context the true meaning of the value "3 MPa" for the heat-shrinkage stress in Claim 1 was discussed. In the board's view, the true meaning of "3 MPa" in Claim 1 is "3.0 MPa", which means that for the purposes of novelty of Claim 1 a value such as 3.4 MPa in D4 cannot be rounded down to 3 MPa. This interpretation of Claim 1 is based particularly on the examples in the opposed patent. Thus in Comparative Examples 5 and 6, values such as 3.4/3.2 MPa and 3.3/3.1 MPa are associated with embodiments not representing the claimed invention.

3. Admissibility of late-filed document D24

Document D24 was filed by the appellant with a letter dated and received on 15 February 2011, one month before the oral proceedings arranged to be held on 15 March 2011. The appellant argued that this late-filing was a reaction to the board's communication of 1 December 2010. According to the appellant D24 was highly relevant, because it disclosed the control of shrink tension (i.e., heat-shrinkage stress)

independently from the degree of free shrink (i.e., hot water shrink), and because it disclosed heat-shrinkage stress control simultaneously in the transversal and the longitudinal directions in order to avoid packaging distortions.

3.1 The late-filed document did not change the appellant's principle line of argument on the basis of which Claim 1 of the main request had been attacked for lack of inventive step in the opposition and appeal proceedings. The board accepts that D24 was simply introduced to support further the position previously taken by the appellant, namely that it was known in the state of the art to reduce the shrink tension (heat-shrinkage stress) of a hot-water shrinkable film by means of an annealing step without at the same time reducing the free shrink (hot water shrink) of the film. In view of the above considerations the board accepted that D24 was *prima facie* highly relevant for the issue of inventive step and consequently admitted it into the proceedings in the exercise of its discretion under Article 13(3) RPBA.

4. Inventive step

4.1 The board in agreement with the parties and the opposition division considers D4 to represent the closest state of the art. This document belongs to the art of manufacturing tubular, biaxially oriented, heat-shrinkable films to be used in automatic packaging, such films having a film structure which is the same as that of the film claimed, and which have the same hot water shrinkability at 90°C.

D4 discloses a tubular (page 4, lines 29-35; page 5, lines 22-29) heat-shrinkable (page 4, lines 40-42), packaging (page 1, lines 3-4; page 8, lines 22-30; Claim 10) multilayer film comprising at least three layers including an outer surface comprising a polyester resin, an intermediate layer comprising a polyamide resin and an inner surface layer comprising a sealable resin (page 3, lines 5-10; Examples 1-4). This multilayer film exhibits a hot water shrinkability at 98°C higher than 20% (page 4, lines 40-42; Examples 1-4). Although it is not explicitly disclosed, the film of D4 is clearly in the form of a roll, this being commonplace in this art. This was not contested by the respondent.

Hence, the claimed film differs from that of D4 solely by the feature "heat-shrinkage stress at 50°C of at most 3 MPa both in longitudinal direction and in transverse direction". D4 does not disclose this claimed value range. In fact, it does not mention heat-shrinkage stress of the tubular film at all.

- 4.2 The technical problem identified in the contested patent (paragraphs [0006] and [008]) is to provide a heat-shrinkable film adapted to automatic packaging and thus not causing any distortion or deformation of the packaged product when used in shrink packaging applications such as flow-wrap packaging of articles held in trays, flow-wrap packaging of pizzas and other angular products, and lidding of trays.

The appellant conceded that the objective technical problem in view of D4 is the provision of a heat-shrinkable film which would not cause any distortion of

the packaged product when used in shrink-packaging applications.

As a solution to this problem the control of the heat-shrinkage at 50°C to at most 3 MPa both in the longitudinal and the transverse direction is proposed. The board is satisfied that this technical problem has indeed been solved by the patent. The experimental evidence in the patent in suit illustrates the improvement in packaging properties when the heat-shrinkage stress at 50°C is at most 3 MPa both in the longitudinal and transverse direction (Table 2 indicates which examples are to be compared with which comparative examples; Tables 3-7 illustrate the packaging properties of these examples and comparative examples). In particular Comparative Example 10, which is very similar to Example 1 of D4 (see the appellant's letter of 15 March 2011, point 3), shows that the packaging properties of a multilayer tubular film with a heat-shrinkage stress outside the claimed range, in particular the combination 2.6/3.4 MPa, are worse than those of a film fulfilling the requirements of Claim 1 of the main request.

- 4.3 The question which remains to be answered is whether the skilled person starting from the disclosure of D4, specifically from Example 1, which as already noted is very similar to Comparative Example 10 of the patent in suit, and aiming at improving its packaging properties would find it obvious to keep the heat-shrinkage stress at 50°C to at most 3 MPa both in longitudinal direction and in transverse direction while maintaining the hot-water shrinkability at high values.

4.3.1 The board concurs with the appellant that the skilled person seeking to solve the above technical problem would find in D24 the hint to keep the heat-shrinkage stress both in longitudinal direction and in transverse direction at low values while maintaining the hot-water shrinkability at high values.

4.3.2 D24 (column 2, line 24 to column 3, line 16; Example 15; Figures 2-5), which was published on 20 December 1970, discloses that manufacturing of films to be used for packaging of easily deformable articles was already known in 1970. In column 2, lines 30-46 it is said:

*"The ability of the novel process to produce films having a wide range of shrinkage characteristics is particularly valuable for films to be used for packaging. For such films it is often desirable to have a film with high shrink values but low shrink tensions. Such films can readily be produced by the novel process, but not easily by the known processes. The single step bubble process results in films with low shrink tensions, but with very limited shrink in both directions. The two step bubble process and the tenter frame operations on the other hand give films with substantially higher degrees of biaxial shrink; this property is, however, always combined with a relatively high shrink force, if the films are not annealed in a separate process step.*

*Low values of shrink tension are especially desirable when articles which are easily deformable have to be packed."*

From this document, it has been known that high shrink/low shrink tension (i.e., heat-shrinkage stress) films are desirable when packaging deformable products. Such films could be obtained from high shrink / high shrink tension films, e.g. obtained by the double bubble process, by reducing the shrink stress by subsequent annealing in a separate process step. In relation to PVC films, D24 discloses in the paragraph bridging columns 2 and 3 a combination of shrink values up to 60% in both directions with a shrink tension as low as 7 kg/cm<sup>2</sup> (0.7 MPa). In the same paragraph, D24 mentions that "*[n]ot only can the shrink tension and shrink value be varied independently, but also films can be made whose shrink properties are non-balanced.*" An example of such a non-balanced film is a biaxially oriented film which has 40% shrink in both directions at 100°C with a transverse shrink tension maximum of 7 kg/cm<sup>2</sup> (0.7 MPa) and a shrink tension in the longitudinal direction of 17.5 kg/cm<sup>2</sup> (1.7 MPa). Thus, as stressed by the appellant, D24 discloses the concept of converting a high shrink / high shrink tension film to a high shrink / low shrink tension film, i.e., the significant reduction of the shrink tension without reducing the free shrink of the film. In fact, the shrink tension can be adjusted to suit the required purpose without sacrificing in hot water shrinkability.

- 4.3.3 It follows from the above that a person skilled in the art starting from D4 as the closest prior art and trying to solve the above identified objective technical problem would learn from D24 that by means of an annealing step the shrink tension of a hot-water shrinkable film can be reduced significantly without reducing the free shrink of the film. By applying the



teaching of D24 to the films of D4, the person skilled in the art would inevitably arrive at films falling within the scope of Claim 1 of the main request.

- 4.3.4 The board acknowledges that D24, contrary to the films of Claim 1 of the main request, essentially concerns monolayer films and particularly films of PVC. Nevertheless, the skilled person would have had a motivation to apply the concept of D24 to other film resins and other film structures:

In column 3, lines 8-15 of D24 it is said:

*"Thermoplastic polymers which can be used in the process of the invention include all film forming resins which can be oriented in the softened or molten state, i.e. above the glass transition temperature in the case of amorphous polymers, and in the case of polymers with a certain degree of crystallinity above the temperature where substantial crystallization takes place when these polymers are cooled down from the temperature used for extrusion."*

This sentence makes it clear that the teaching of D24 on how to make high shrink / low tension films is not limited to particular polymeric materials, but is applicable to all film-forming resins which can be oriented in the softened or molten state. Thus, D24 itself provides a hint to employ the disclosed concept on other resins. Furthermore the person skilled in the art of automatic packaging, when reading D24, would realize that the required control of the film shrink properties necessary for successful shrink packaging would not be exclusively important for the monolayer

films of D24 but would equally be required for the multilayer films, which were already common packaging material on the priority date of the patent in suit (see D4). He would have found it obvious to apply the concept disclosed by D24 for monolayer films to multilayer films with a reasonable expectation of success and would have come to the claimed subject-matter within the context of his ordinary skills without the exercise of an inventive step.

4.4 For these reasons the subject-matter of Claim 1 of the main request is not based on an inventive step in view of D4 in combination with D24. Therefore the main request is not allowable.

5. Admissibility of Auxiliary Requests A, B and C

5.1 After having heard the board's conclusion on the patentability of Claim 1 of the main request, which equally applied to the only auxiliary request then on file, the respondent asked for an opportunity to file further auxiliary requests. After a break the respondent filed new Auxiliary Requests A, B and C and withdrew the previous auxiliary request.

5.2 The appellant requested that Auxiliary Requests A and B be not admitted into the proceedings, because the product claims of these requests were not suitable to overcome the inventive step objection raised with respect to the main request. The board also pointed out that Auxiliary Requests A and B contained a product-by-process claim which did not have a counterpart in either the granted claims or in the previous auxiliary request. Furthermore, there appeared to be no evidence

in the patent itself which would link the introduced process feature with any additional technical effect. The appellant concurred with the board's view in this respect. The respondent, on the other hand, offered no explanation.

5.3 Thus, in view of the new issue arising out of the introduction of the process feature into a product claim and in view of the fact that it was not *prima facie* apparent how Auxiliary Requests A and B could overcome the inventive step objection raised against the main request, the board, in the exercise of its discretion, did not admit Auxiliary Requests A and B into the proceedings (Articles 13(1) and (3) RPBA).

5.4 Auxiliary Request C, which no longer contained any product claim, was admitted into the proceedings. The appellant did not raise any objection in this respect.

6. The respondent's written statement

6.1 Later during the oral proceedings the respondent filed a statement and requested that it be included into the minutes of the oral proceedings (which it duly was). This statement read as follows:

"Respondent is of the opinion that the fact that D24 is admitted so late (1 month prior to oral proceedings) in the proceedings followed by the subsequent denial of the admissibility of late filed claims is in violation of the right to be heard (R 113) [*sic*] and R 112 [*sic*]. The board also failed to ask why we believed that the Auxiliary Request A and B would overcome any of the

objections. It is considered and submitted as a procedural violation of the right to be heard."

6.2 However, the board saw no reason to take action having regard to that statement, let alone to reconsider its conclusion concerning the non-admittance of Auxiliary Requests A and B:

First of all, the mere fact that the board decided in the appellant's favour on the admissibility of D24 but against the respondent on the admissibility of Auxiliary Requests A and B does in itself not constitute an unfair treatment of the respondent, let alone a violation of its right to be heard. Each admissibility issue was evaluated according to its own merits, with the result that D24 was admitted into the proceeding (*prima facie* highly relevant) but not Auxiliary Requests A and B (the newly introduced process feature raised new issues and *prima facie* was not suitable to overcome the inventive step objection).

Furthermore, the board first invited the respondent to explain the reasons for the filing of the new auxiliary requests. The board then expressed its concerns regarding the product-by-process claims. Finally it gave both parties the opportunity to comment on the issue as to whether or not these requests should be admitted into the proceedings. In the course of the ensuing discussion the appellant contested inventive step of the product-by-process claims. The respondent provided only arguments regarding the disclosure under Article 123(2) EPC and inventive step as regards independent Claim 1 of Auxiliary Request A, which was a combination of Claims 1 and 14 of the main request.

After having heard the parties the board concluded the debate on the admissibility and interrupted the proceedings for deliberation on that issue.

The board has no obligation to continually ask the parties to take a position on each and every argument presented by the other party during the course of oral proceedings. On the contrary, it is the responsibility of each party involved to decide on which argument presented by the other party or the board it will respond, and how to respond.

Therefore respondent's complaint that the board had failed to ask why it believed that Auxiliary Requests A and B would overcome any of the objections was in the board's view unfounded, both as a matter of fact and of law.

*Auxiliary Request C*

7. Inventive step

Auxiliary Request C contains a single claim, which corresponds to granted process Claim 15. The appellant did not contest the novelty of the claimed process and the board is satisfied that none of the cited documents discloses such a process. Therefore the only issue regarding this request is that of inventive step.

7.1 The board in agreement with the parties considers that D4 represents the closest state of the art (see explanations provided above, point 4.1).

The claimed process differs from the process disclosed in D4 (page 4, lines 29-44) in that the tubular film is subjected to a heat-treatment from its outer surface layer (a) with steam or warm water at 60-98°C before cooling to provide a biaxially oriented film with a heat-shrinkage stress at 50°C of at most 3 MPa both in longitudinal direction and transverse direction and a hot water shrink at 90°C of at least 20%.

- 7.2 As with the main request, the technical problem to be solved is derivable from the contested patent (paragraphs [0006] and [008]) and can be seen in the provision of a process for the production of a heat-shrinkable film which would not cause any distortion of the packaged product when used in shrink packaging applications.

The proposed solution to this problem is the specific heat treatment defined in Claim 1 of Auxiliary Request C, namely a heat-treatment of a multilayer film from its outer surface layer (a) with steam or warm water at 60-98°C before cooling to provide a biaxially oriented film with a heat-shrinkage stress at 50°C of at most 3 MPa both in longitudinal direction and transverse direction and a hot water shrink at 90°C of at least 20%.

The board is satisfied that this technical problem has indeed been solved. The experimental evidence in the patent in suit illustrates the improvement in packaging properties of a tubular film prepared according to the claimed process. Tables 3-7 illustrate the improvement in packaging properties of the exemplified films prepared according to the claimed process over those of

the comparative films prepared according to a process which does not comprise heat-treating the biaxially oriented tubular films, i.e., films prepared according to D4 (compare Examples 1-3 with Comparative Example 1; Examples 4-11 with comparative example 2; Examples 12-15 with Comparative Example 4; Example 17 with Comparative Example 6; Example 18 with Comparative Example 7 and Example 19 with Comparative Example 8).

- 7.3 The question which remains to be answered is whether the skilled person starting from the disclosure of D4 and aiming at a process which provides a tubular film with improved packaging properties would find a motivation in the state of the art to submit the biaxially oriented tubular film to a heat treatment from its outer surface (a) with steam or warm water at 60-98°C and subsequently cool it in order to obtain a film which exhibits a heat-shrinkage stress at 50°C of at most 3 MPa both in longitudinal direction and in transverse direction and a hot water shrink at 90°C of at least 20%.

D24, which discloses the concept of heat-treating biaxially oriented films in order to reduce the shrink tension (i.e., heat-shrinkage stress), does not disclose the specifically claimed heat-treatment. In column 5, lines 36-65, it discloses a treatment involving heating the film as it passes between two sets of nip rolls with an overfeed corresponding to the desired amount of longitudinal pre-shrinkage and with the distance between the nip rolls and the length of the heating zone being adjusted to give the desired amount of transverse shrinkage. In the absence of any disclosure in D24 of the specific heat-treatment of the

biaxially oriented tubular multilayer film, a skilled person would not arrive at a process falling within the scope of Auxiliary Request C, even when combining D4 with D24.

Also D5, D10 and D19, cited by the appellant, do not disclose the claimed heat-treatment to be applied to a biaxially oriented multilayer film.

D5 (page 14, line 25 to page 16, line 26) discloses heating a tubular biaxially oriented film by conventional techniques, such as exposure of the film to radiant elements, passing the film through a heated air oven or an IR oven or - preferably - contacting the film with the surface of one or more heated plates or rollers. This heating aims, however, only at the reduction of the shrink stress in the transversal direction. Moreover, the skilled person would not use the preferred heating step using heating rollers because this would inevitably result in non-uniform heat conduction to superposed film layers and would fail to uniformly reduce the biaxial heat-shrinkage stress while retaining biaxial heat shrinkability of the film of D4. Thus the skilled person would not be motivated to combine D4 with D5.

D10 (page 6, Example 1) discloses heat-treating the tubular biaxially oriented multilayer film by passing it through a processing unit consisting of 6 stainless steel rollers heated to a temperature of from about 70°C to 90°C and two rollers cooled to about room temperature, at a constant speed, for a total heating time of about 1.60 seconds. Thus the heat-treatment of



D10 is similar to that of D24 and its combination with D4 would also not lead to the claimed subject-matter.

D19 (Claim 5) discloses a process for the production of a tubular film consisting of polyamide to be used for packaging comprising the step of subjecting the extruded and multi-axially stretched primary tube to a thermal treatment carried out using hot water, steam or a heated polyvalent alcohol at temperatures of at least 90°C and at most 150°C. Despite the fact that D19 discloses a heat-treatment that overlaps with that of the claimed process, this document does not provide any motivation to the skilled person to use this heat-treatment in the process of D4 when trying to solve the objective technical problem set out above. This is not just because D19 relates to tubular monolayer polyamide films but also, most importantly, for two other reasons: First, D19 sets out to solve a technical problem different from that defined in the present case, namely to provide a tubular film that can be cut without tearing, peeled spirally, vacuum packed when sliced and at the same time has a matt appearance (column 3, lines 22-27). Second, D19 refers only to controlled shrinkage - equivalent to the hot water shrinkability of the patent in suit - which should be kept between 15% and 40% (column 5, lines 23-45).

7.4 For these reasons, it has to be concluded that the skilled man starting from D4 and seeking to provide a process for the preparation of an improved tubular multilayer film would not have found in the state of the art any hint to submit the biaxially oriented film of D4 to a heat-treatment such as defined in the claimed process.

8. Since the process of Claim 1 of Auxiliary Request C is not obvious in the light of the available prior art and fulfils also the other requirements of the EPC, Auxiliary Request C is allowable.

## **Order**

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

1. The decision under appeal is set aside.
2. The case is remitted to the opposition division with the order to maintain the patent on the basis of the single claim forming Auxiliary Request C filed during the oral proceedings before the board, after any necessary consequential adaptation of the description.

The Registrar:

The Chairman:

G. Röhn

W. Sieber