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# Datasheet for the decision of 18 July 2013

**Case Number:** T 1461/11 - 3.3.03

**Application Number:** 05007986.2

**Publication Number:** 1712574

**IPC:** C08F297/08, C08F10/02, C08J5/18

**Language of the proceedings:** EN

**Title of invention:**
Polyethylene film with improved processability and mechanical properties

**Patent Proprietor:**
Borealis Technology Oy

**Opponent:**
THE DOW CHEMICAL CO.

**Headword:**

**Relevant legal provisions:**
RPBA Art. 13(3)
EPC Art. 83

**Keyword:**
Late-filed request - admitted (yes)
Sufficiency of disclosure - undue burden (no)

**Decisions cited:**

**Catchword:**

Europäisches Patentamt
European Patent Office
Office européen des brevets

**Beschwerdekammern**
**Boards of Appeal**
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**Case Number: T 1461/11 - 3.3.03**

# D E C I S I O N
# of Technical Board of Appeal 3.3.03
# of 18 July 2013

| | |
|---|---|
| **Appellant:** (Patent Proprietor) | Borealis Technology Oy<br>P.O. Box 330<br>06101 Porvoo (FI) |
| **Representative:** | Kador & Partner<br>Corneliusstrasse 15<br>80469 München (DE) |
| **Respondent:** (Opponent) | THE DOW CHEMICAL CO.<br>2030 Dow Center<br>Midland, Michigan 48674 (US) |
| **Representative:** | Boult Wade Tennant<br>Verulam Gardens<br>70 Gray's Inn Road<br>London WC1X 8BT (GB) |
| **Decision under appeal:** | **Decision of the Opposition Division of the European Patent Office posted on 23 May 2011 revoking European patent No. 1712574 pursuant to Article 101(3)(b) EPC.** |

**Composition of the Board:**

**Chairman:** B. ter Laan
**Members:** D. Marquis
R. Cramer

## Summary of Facts and Submissions

I. The appeal by the patent proprietor lies from the decision of the opposition division posted on 23 Mai 2011 revoking European patent N° 1 712 574 based on application number 05 007 986.2, having a filing date of 12 April 2005.

II. The patent was granted with a set of 14 claims of which claims 1, 13 and 14 read as follows:

"1. A film comprising at least one layer comprising an ethylene homo- or copolymer which has a complex viscosity at 5 kPa shear stress eta 5 of 200,000 or less and a shear thinning index SHI(5/300) measured at 190 °C as the ratio between the complex viscosity at 5 kPa shear stress and the complex viscosity at 300 kPa shear stress of 120 or more."

"13. An ethylene homo- or copolymer composition which has a complex viscosity at 5 kPa shear stress eta5 of 200,000 or less and a shear thinning index SHI(5/300) measured at 190°C as the ratio between the complex viscosity at 5 kPa shear stress and the complex viscosity at 300 kPa shear stress of 120 or more."

"14. Use of ethylene homo- or copolymer which has a complex viscosity at 5 kPa shear stress eta5 of 200,000 or less and a shear thinning index SHI(5/300) measured at 190 °C as the ratio between the complex viscosity at 5 kPa shear stress and the complex viscosity at 300 kPa shear stress of 120 or more for the production of a film."

Claims 2 to 12 were directed to preferred embodiments of claim 1.

III. A notice of opposition against the patent was filed in which the revocation of the patent was requested based on the grounds according to Article 100(a) EPC (lack of novelty and lack of inventive step) and Article 100(b) EPC.

The decision of the opposition division revoking the patent was based on the main request (patent as granted), a first auxiliary request filed on 9 July 2009 and second and third auxiliary requests filed on 2 March 2011. According to the opposition division, none of the requests on file complied with the requirements of Article 83 EPC. The following documents were inter alia relied upon:

D4: Declaration and experimental report by Mr. W.J. Michie and Dr. J. Wang
D12: WO 00/22040

According to the decision, the skilled person could not be sure whether he worked within the forbidden area or not, due to the insufficient disclosure of the methods for determining the complex viscosity at 5 kPa shear stress eta 5 and the shear thinning index SHI(5/300) measured at 190°C. Also, the examples did not provide the skilled person with a clear instruction how to prepare the claimed subject-matter. Therefore the opposed patent and the invention to which it related were insufficiently disclosed.

IV. On 28 June 2011, the patent proprietor lodged an appeal against that decision and paid the prescribed appeal fee on the same day. The statement setting out the

grounds of the appeal was filed on 4 October 2011. The appellant requested that the patent be maintained on the basis of the main or an auxiliary request, both attached to the statement of grounds of the appeal. A declaration of Dr. M. Gahleitner including a set of figures was also filed (D14).

V. By letter of 23 February 2012 in reply to the statement of grounds of appeal, the respondent requested the dismissal of the appeal. He further requested that, if the main or auxiliary request were found to meet the requirements of Article 83 EPC, the case be remitted to the opposition division for consideration of the remaining grounds of opposition. A declaration of Dr. J. Wang was filed (D15).

VI. On 22 February 2013, the Board issued a summons to attend oral proceedings. In a communication by the Board dated 14 June 2013, the issues to be discussed under Articles 123(2), 123(3), 83 and 84 EPC were pointed out.

VII. By letter of 17 June 2013, the appellant submitted a new main request as well as new auxiliary requests 1 to 7 in replacement of the previous requests. A declaration by Dr. J. den Doelder with accompanying Figures 1 to 4 was also provided (D16).

VIII. By letter dated 5 July 2013, the respondent contested the new requests under Articles 83, 84 and 123(2) EPC as well as Rule 80 EPC. A document entitled: "Owner’s Manual, Rheometrics Dynamic Analyzer RDA-II" as well as an annex containing further dynamic oscillatory shear measurements from 500 rad/s to 0,05 rad/s were also provided (D17).

IX. On 15 July 2013, the appellant filed a new main request (claims as granted). The main and auxiliary requests 1 to 7 filed with letter dated 17 June 2013 were renumbered to auxiliary requests 1 to 8.

X. Oral proceedings were held on 18 July 2013.

XI. The appellants' arguments may be summarised as follows:

- The subject-matter of the main request had never been abandoned and it had always been the main point of discussion. It was provided as a reaction to the attacks under Article 123(2) and 84 EPC, in particular in reply to an argument pursuant to Article 84 EPC regarding the shear thinning index SHI(5/300) developed by the respondent in his letter dated 5 July 2013, and could therefore not come as a surprise to the respondent. The granted version of the claims made matters simpler. Therefore, the main request should be admitted to the proceedings.

- D17 was filed too late and should not be admitted to the proceedings.

- The patent in suit contained sufficient information for the skilled person to determine the shear thinning index. A skilled person would know how to perform an extrapolation of the viscosity on the basis of the shape of the curve as shown in D14, D15 and D16. The objection relating to the lack of definition of the extrapolation method of the complex viscosity at shear rates above 300 rad/s was an objection of lack of clarity rather than insufficiency of disclosure.
- During the oral proceedings before the opposition division, the appellant had not been heard on the objection concerning the discrepancies of the measured

melt flow rates in the examples of the patent in suit. This issue had not been discussed but was nevertheless addressed on page 6 of the written decision. Therefore, Article 113(1) EPC was not complied with, for which reason the appealed decision should be set aside.

XII. The respondents' arguments may be summarised as follows:

- The main request was filed only a few days before the oral proceedings. No valid reasons were given by the appellant justifying the late filing of that request. It had not been filed with the statement of grounds of appeal and its filing at this stage of the proceedings came as a surprise.

- The objections under Articles 123(2) and 84 EPC had been raised in the reply to the statement of grounds of the appeal. The issue of Article 84 EPC had also been discussed before the opposition division, so there was no reason for the late filing of the main request. Its admissibility would change the nature of the appeal. The main request was furthermore not *prima facie* clearly allowable.

- D17 should be admitted to the proceedings.

- The patent in suit instructed the reader that the frequency used for the measurement of the complex viscosity of the claimed compositions was chosen in the range of 0,05 to 300 rad/s. The dynamic oscillatory shear measurements were not reliable when conducted at frequencies above 300 rad/s due to physical limitations of the rheometer. The values of the complex viscosity obtained at frequencies above 300 rad/s were therefore extrapolated using a mathematical model which was not

described in the patent in suit and which was also not available to the skilled person. With a shear thinning index above 200, extrapolation was always required. D14 and D15 showed that different types of extrapolation were available to the skilled person, each giving different results. The figures of D16 did not show that a skilled person would necessarily know how an extrapolation could be applied. The linear regression illustrated in D16 was meant to determine extremum values of the viscosity and did not represent an extrapolation of the viscosity values. No standard extrapolation method existed and the application of linear regression was not necessarily correct. Even the extrapolation conducted by the appellant in D14 showed that extrapolated values could have a margin of error of up to 6,5%. Because extrapolation was needed for most of the range claimed for the shear thinning index and because of the uncertainties concerning the values obtained from extrapolation, an ambiguity arose that permeated through the whole claim. This amounted to a lack of sufficiency of disclosure of the claimed subject-matter.

- In addition, there existed a discrepancy in the melt flow rate values ($MFR_2$) of the examples of the patent in suit which indicated that claim 12 was not sufficiently disclosed. The appellant had been heard by the opposition division on this point. Furthermore, the conditions of the extrusion were not provided, nor were sufficient details given on the methods to be used to determine the dart drop strength of claim 4 and the Elmendorf tear strength of claim 12.

XIII. The appellant (patent proprietor) requested that the decision under appeal be set aside and that the patent be maintained as granted (main request), or

alternatively be maintained in amended form according to one of the auxiliary requests 1 to 8, filed as main request and auxiliary requests 1 to 7 with letter of 17 June 2013. It also requested that the case be remitted to the department of first instance for deciding on the issues of novelty and inventive step. Finally the appellant requested that the "Annex" filed with the respondent's letter of 5 July 2013 be not admitted to the procedure.

XIV. The respondent (opponent) requested that the appeal be dismissed. If the board found that any of the appellant's requests met the requirements of Article 83 EPC, the respondent requested that the case be remitted to the department of first instance for consideration of the remaining grounds of opposition. Finally the respondent requested that the "Annex" filed with its letter of 5 July 2013 be admitted to the procedure.

## Reasons for the Decision

1. The appeal is admissible.

*Main request*

2. Admissibility

2.1 A clarity objection against what was then the main request (now auxiliary request 1) had been raised by the respondent in its reply to the statement of grounds of the appeal of 23 February 2012. However, the arguments pertaining to the minimum SHI value in relation to the necessary high level of extrapolation were raised for the first time in the letter of 5 July 2013. By letter of 15 July 2013 the appellant

changed the minimum SHI value, returning to the claims as granted as the main request. In view of that course of events the Board is satisfied that the main request was filed as a direct reaction to the letter of the respondent of 5 July 2013.

2.2 The change of the minimum shear thinning index SHI(5/300) does not change the nature of the objection raised by the respondent under Article 83 EPC, as acknowledged by the respondent himself in point 2.3 of his letter of 5 July 2013. Also, the main request was dealt with in the contested decision so that it does not constitute a new case. Therefore, the admission of the main request to the proceedings does not raise issues that the respondent could not reasonably be expected to deal with without adjournment of the oral proceedings.

2.3 In view of the above considerations the main request filed by the appellant on 15 July 2013 is admitted to the proceedings in accordance with the provisions of Article 13(3) RPBA.

3. Article 83 EPC

3.1 The subject-matter of claim 1 as granted concerns a film comprising a polyethylene that has a complex viscosity at 5 kPa shear stress eta 5 of 200 000 or less as well as its shear thinning index SHI(5/300) measured at 190°C of 120 or more. Claim 1 as granted does not define the method to be used to determine these rheological properties. Only in paragraph [0065] of the patent in suit it is disclosed that:

"*Dynamic Theological measurements were carried out with a rheometer, namely Rheometrics RDA-II QC, on*

*compression moulded samples under nitrogen atmosphere at 190 °C using 25 mm diameter plates and plate geometry 1.2 mm gap. The oscillatory shear experiments were done within the linear viscosity range of strain at frequencies from 0.05 to 300 rad/s (ISO 6721-1).*"

3.2 It was not disputed that the measurement of the rheological properties could be reliably performed by a skilled person at the frequency range of 0,05 to 300 rad/s indicated in the patent in suit. It was also not disputed that at higher frequencies, extrapolation based on the values obtained at frequencies within the above mentioned frequency range was necessary. The patent in suit does however not indicate how the extrapolation was carried out for frequencies above 300 rad/s. The parties agreed that extrapolation methods could and had to be used in the present case, but disagreed on which one of the available extrapolation methods would be used by the person skilled in the art and with which results. In this respect, D14 and D15 illustrate that extrapolation of the complex viscosity can be performed above 300 rad/s once a polynomial fitting is chosen. For instance, it can be done by choosing a polynomial fitting with the standard software that comes with the Rheometrics rheometer (D15, last paragraph of page 1).

3.3 The parties agreed on the fact that, depending on the method used, extrapolation of the complex viscosities obtained at shear rates above 300 rad/s and up to at least 642 rad/s as calculated for examples 4 and 5 of the patent in suit, could lead to different results, the appellant indicating variations of up to 6,5% (D14) and the respondent variations that could be as high as 18,4% (D15). Therefore, there can be no doubt about the existence of an uncertainty in the determination of the

complex viscosities due to a lack of information regarding the extrapolation at high frequencies.

However, even if the choice of the method of extrapolation may lead to variations in the extrapolated value of the complex viscosity of the ethylene homo- or copolymer obtained at shear rates above 300 rad/s, this alone does not constitute a lack of sufficiency of disclosure regarding the claimed subject-matter as a whole. It has not been shown that the uncertainty concerning the complex viscosity measurement affects the ethylene homo- or copolymer composition or film thereof to such an extent as to create an undue burden. Evidence that this uncertainty prevents the skilled person to produce a composition falling within the ambit of claim 13 or a film made thereof falling within the scope of claim 1 has not been provided by the respondent.

Therefore, the respondent has neither shown that the uncertainty concerning the determination of the complex viscosity permeates throughout the whole claim nor that it is associated with an undue burden.

3.4 As a result, the objection of the respondent relating to the determination of the complex viscosity of the ethylene homo- or copolymer composition is not an objection under Article 83 EPC.

3.5 Since D14 and D15 are relevant for the issue of extrapolation of the viscosity at frequencies above 300 rad/s and were used by both parties in their arguments, they are admitted to the proceedings. D16 does not disclose extrapolations of the viscosity at frequencies above 300 rad/s and it is not relevant to the present decision so that it is not admitted to the proceedings.

The Annex filed on 5 July 2013 (D17) shows that at high frequencies the properties of the polymer sample cannot be reliably measured and that extrapolation is needed. This was not disputed by the appellant and is already shown by the other documents in the proceedings. The annex D17 is therefore not more relevant to the present decision than the documents already on file, so that it is not admitted to the proceedings.

3.6 Further arguments concerning sufficiency of disclosure had been raised in the first instance proceedings but were not decided upon by the opposition division. Those arguments *inter alia* relate to discrepancies noted in the melt flow rates ($MFR_2$) reported in the examples of the patent in suit (mentioned on page 6 of the contested decision but upon which no conclusion has been based that is relevant for the decision regarding Article 83 EPC) and the lack of definition of the method used to determine dart drop and Elmendorf tear strength (claims 4 and 12 of the main request). Since those arguments have not been decided on by the opposition division, the Board is not in a position to consider the merits of the disclosure of the patent in suit in its entirety. Also, no decision has been taken on further grounds of opposition. Under these circumstances the Board considers it appropriate to remit the case to the first instance for further prosecution.

**Order**

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

1. The decision under appeal is set aside.

2. The case is remitted to the department of first instance for further prosecution.

The Registrar: The Chairman:


E. Goergmaier B. ter Laan

Decision electronically authenticated