**Internal distribution code:**

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

# Datasheet for the decision of 29 April 2025

**Case Number:** T 0206/23 - 3.3.09

**Application Number:** 17768293.7

**Publication Number:** 3519190

**IPC:** B32B27/32, C08F210/16, C08L23/08

**Language of the proceedings:** EN

**Title of invention:**
BLOWN FILMS WITH IMPROVED PROPERTIES

**Patent Proprietor:**
DOW GLOBAL TECHNOLOGIES LLC

**Opponent:**
Borealis AG

**Headword:**
Blown films/DOW GLOBAL

**Relevant legal provisions:**
EPC Art. 100(a), 54, 56

**Keyword:**
Novelty - (yes)
Inventive step - (yes)



This datasheet is not part of the Decision
It can be changed at any time and without notice

**Decisions cited:**
T 0646/05


This datasheet is not part of the Decisior
It can be changed at any time and without notic

Europäisches Patentamt
European Patent Office
Office européen des brevets

**Beschwerdekammern**

**Boards of Appeal**

**Chambres de recours**

Boards of Appeal of the
European Patent Office
Richard-Reitzner-Allee 8
85540 Haar
GERMANY
Tel. +49 (0)89 2399-0

**Case Number: T 0206/23 - 3.3.09**

# D E C I S I O N
# of Technical Board of Appeal 3.3.09
# of 29 April 2025

| | |
|---|---|
| **Appellant:** (Opponent) | Borealis AG<br>Wagramer Strasse 17-19<br>1220 Vienna (AT) |
| **Representative:** | Kador & Partner Part mbB<br>Corneliusstraße 15<br>80469 München (DE) |
| **Respondent:** (Patent Proprietor) | DOW GLOBAL TECHNOLOGIES LLC<br>2040 Dow Center,<br>Midland, MI 48674 (US) |
| **Representative:** | Boult Wade Tennant LLP<br>Salisbury Square House<br>8 Salisbury Square<br>London EC4Y 8AP (GB) |
| **Decision under appeal:** | **Decision of the Opposition Division of the European Patent Office posted on 9 December 2022 rejecting the opposition filed against European patent No. 3519190 pursuant to Article 101(2) EPC.** |

**Composition of the Board:**

| | |
|---|---|
| **Chairman** | A. Haderlein |
| **Members:** | F. Rinaldi |
| | A. Jimenez |

## Summary of Facts and Submissions

I. This decision concerns the appeal filed by the opponent (appellant) against the opposition division's decision to reject the opposition.

II. In the notice of opposition, the opponent had requested that the patent be revoked under Article 100(a) EPC for lack of novelty and lack of inventive step.

III. The documents cited during the opposition proceedings included:

D1: WO 2015/200743 A1
D2: ASTM D1238-20
D3: WO 2016/083208 A1
D4: Declaration by Andreas Albrecht
D5: Declaration by Mahdi Abbasi
D6: R. N. Haward *et al.*, "Effect of blending on the molecular weight distribution of polymers", Journal of Polymer Science: Part A, 2, 1964, 2977-3007
D7: K. B. McAuley *et al.*, "On-line inference of polymer properties in an industrial polyethylene reactor", American Institute of Chemical Engineers Journal, 37(6), 1991, 825-35
D8: B. H. Bersted *et al.*, "Prediction of rheological behavior of branched polyethylene from molecular structure", Journal of Applied Polymer Science, 26, 1981, 1001-14
D13: Declaration by Francisco Sacchetti

All the declarations were filed by the opponent.

IV. In the decision under appeal, the opposition division concluded that the subject-matter of claim 1 of the patent as granted was novel over D1 and D3 and involved an inventive step starting from the closest prior art, namely inventive composition 6 of D1. D3 was not a suitable starting point for assessing inventive step.

V. On appeal, the patent proprietor (respondent) filed a total of 14 auxiliary requests.

VI. The claim relevant to this decision is claim 1 of the patent as granted (main request), which reads as follows.

"*A multilayer blown film having an inner layer, a first outer layer, and a second outer layer, wherein:*

*the inner layer comprises an ethylene-based composition comprising at least one ethylene-based polymer, wherein the ethylene-based composition has a MWCDI value greater than 0.9, and a melt index ratio ($I_{10}/I_2$) that meets the following equation:*
*$I_{10}/I_2 \geq 7.0 - 1.2 \times \log (I_2)$; and*

*the first outer layer and the second outer layer independently comprise a polyethylene composition which comprises the reaction product of ethylene and, optionally, one or more alpha olefin comonomers, wherein the polyethylene composition is characterized by the following properties:*

*(a) a melt index, $I_2$, of from 0.1 to 2.0 g/10 min;*
*(b) a density of from 0.910 to 0.930 g/cc;*
*(c) a melt flow ratio, $I_{10}/I_2$, of from 6.0 to 7.6; and*
*(d) a molecular weight distribution, (Mw/Mn) of from*

*2.5 to 4.0.*"

VII. The appellant's arguments are summarised as follows.

- The subject-matter of claim 1 lacked novelty over the blown film of inventive composition 8 of D1. In view of the margin of error for establishing the melt indexes $I_{10}$ and $I_2$ derivable from D2, there was an inevitable overlap between the disclosure of D1 and the range for the melt flow ratio required by claim 1.
- The subject-matter of claim 1 lacked novelty over the blown film of inventive blend 1 of D3. In view of the rework made in D4 and the calculations based on the results of D4 using the mixing equations in D6 to D8, D3 disclosed all the features of claim 1, in particular the value expressed by the equation for the inner layer and feature (c).
- The subject-matter of claim 1 lacked an inventive step starting from either of these two films. No effect was shown to be caused solely by the distinguishing feature, namely feature (c) of claim 1. Thus, the problem was to provide an alternative. The solution would have been obvious to the skilled person, for example in view of the blown films with inventive compositions 5 and 7 of D1.

VIII. The respondent's arguments are summarised as follows.

- As the opposition division correctly concluded, D1 did not clearly and unambiguously disclose all the features of claim 1, in particular feature (c). As to the objection based on D3, it was questionable that the rework of D4 reflected the disclosure of

D3. Furthermore, the mixing equations used in D4 only provided estimates.

- The opposition division correctly concluded that the subject-matter of claim 1 involved an inventive step. The closest prior art was inventive composition 6 of D1, not inventive composition 8. The tests in the patent showed an improvement in gloss and haze. There was no teaching in D1 to solve the problem of providing a multilayer blown film with improved optical properties.

IX. Final requests

The appellant requested that the decision under appeal be set aside and that the patent be revoked.

The respondent requested that the appeal be dismissed (main request) or, alternatively, that the patent be maintained on the basis of one of auxiliary requests 1 to 10, filed with the reply to the appeal, or auxiliary requests 11 to 14, filed by letter dated 16 April 2024.

## Reasons for the Decision

1. *Patent in suit*

The patent concerns ethylene-based multilayer blown films. The aim of the patent is to provide blown polyethylene films having improved optics, such as low haze values and high gloss, while ensuring good stiffness properties (paragraphs [0001] and [0003]).

2. *Main request – novelty*

2.1 On appeal, the appellant maintained the objections raised during the proceedings before the opposition division that the subject-matter of claim 1 lacked novelty with respect to inventive composition 8 of D1 and inventive blend 1 of D3.

2.2 Novelty over inventive composition 8 of D1

2.2.1 The appellant argued that the monolayer blown film comprising inventive composition 8 of D1 disclosed all the features of claim 1. The monolayer film was produced using a five-layer blown film line with five extruders. Inventive composition 8 was fed into all five extruders, which meant that the film was a multilayer film with five identical layers.

2.2.2 As concerns feature (c) of claim 1 (a melt flow ratio, $I_{10}/I_2$, of from 6.0 to 7.6), the appellant acknowledged that the ratio $I_{10}/I_2$ disclosed in D1 for the composition was 7.7, i.e. higher than required by claim 1. However, in view of the following considerations, the cited composition of D1 was deemed to disclose feature (c) of claim 1.

- The difference between the ratios in D1 and in claim 1 was only 0.1 unit (or 1.31% above the upper limit of claim 1).
- The same standard test method (ASTM D1238, cited as D2) was used in both D1 and the patent in suit to measure the value $I_2$. In view of the data in D2, the measurement was only possible with an error margin of less than 2%.
- The current case differed from that on which T 646/05, discussed in the decision under appeal,

was based. In that decision, it was stated (in Reasons 4.2) that:
"*other values than those directly resulting from the measured values ... which could be obtained when taking measurement errors or manufacturing tolerances into consideration, cannot be regarded as having been made available to the public*".
By contrast, in the current case, the repeatability was explicitly discussed in the ASTM method used.

2.2.3 However, the board is not convinced that inventive composition 8 of D1 discloses feature (c) of claim 1.

2.2.4 The standard test method D2 discloses that the measurement of the melt indexes (or melt flow rates, as they are referred to in D2) $I_{10}$ and $I_2$ involves a margin of uncertainty in its reproducibility. But as the opposition division correctly stated in the decision under appeal (Reasons for the decision, point 4.3.1.2.3):

"*it has not been unambiguously proven that the actual measuring errors affecting the concrete measurement of the $I_{10}/I_2$ ratio of composition 8 of D1 cannot be lower than 2%, or lower than 1.31%, which is the difference between the value of the $I_{10}/I_2$ ratio of composition 8 of D1 and the upper range value of $I_{10}/I_2$ of claim 1 of the opposed patent.*"

2.2.5 Furthermore, the opposition division correctly concluded that since both the melt flow ratio $I_{10}/I_2$ of D1 and the range of melt flow ratio $I_{10}/I_2$ of claim 1 are given with the same precision, there was no need to consider a possible margin of error.

2.2.6 In sum, the fact that the same method is used to determine the melt flow ratios in D1 and in the patent in suit renders the issue of a possible error between the measurements somewhat redundant. An error, if any, is intrinsic to the measuring method. Under the circumstances of the case in hand, there is no discernible reason why an error should be considered when assessing whether the melt flow ratio disclosed in D1 falls under the upper limit of the melt flow ratio range set out in claim 1. The assessment made in T 646/05 (see point 2.2.2 above) still applies – other values than those directly resulting from the measured values cannot be regarded as having been made available to the public.

2.2.7 This means that the melt flow ratio disclosed in D1 for inventive composition 8 and the upper limit of the melt flow ratio range set out in claim 1 can be distinguished. Thus, D1 does not disclose the value set out in claim 1.

2.2.8 The appellant referred to paragraph [0139] of the patent, according to which "*dimensions and values disclosed herein are not to be understood as being strictly limited to the exact numerical values recited ... For example, a dimension disclosed as '40 mm' is intended to mean 'about 40 mm'*".

2.2.9 On the basis of this passage, the appellant argued that the value "about 7.6", which could be read into feature (c) of claim 1, certainly included the value "7.7".

2.2.10 This is not persuasive. There is no indication that the upper limit of the melt flow ratio $I_{10}/I_2$ of feature (c), even when read together with the qualifier

"about", is meant to encompass a melt flow ratio $I_{10}/I_2$ as high as 7.7.

2.2.11 Lastly, even if an error did occur in the measurement of inventive composition 8 of D1, this simply means that the melt flow ratio measured in D1 could overlap with that of claim 1. Put plainly, while there may be a likelihood that the value is satisfied, it is at least just as likely that the value is not satisfied. For instance, an error could also mean that in reality a value for the melt flow ratio of above 7.7 is reached.

2.2.12 To conclude, contrary to the appellant's view, even if a margin of error were to be considered, there is no inevitable overlap between the disclosure of D1 and the range for the melt flow ratio required by claim 1.

2.2.13 Therefore, the subject-matter of claim 1 is novel over inventive composition 8 of D1.

2.3 Novelty over inventive blend 1 of D3

2.3.1 The appellant argued that the five-layer co-extrusion blown film made with inventive blend 1 of D3 fulfilled all the features of claim 1. This blend was made of 90 weight% of the final polymer composition of inventive example 1 (produced as described in D3) and 10 weight% of a commercial polyethylene sold under the trade name FT5230.

2.3.2 While the melt indexes $I_2$ of the two individual polymer components used to prepare the blend are disclosed in D3 (1.5 g/10 min for the final polymer composition of inventive example 1 and 0.75 g/10 min for FT5230), some other parameters required by claim 1 are not. Among other things, no melt index $I_{10}$ is disclosed, either for

the individual polymer components or for the blend itself.

2.3.3 D3 is a patent application filed by Borealis, the appellant. To prove that the features of claim 1 not explicitly mentioned in D3 for inventive blend 1 were nevertheless implicitly part of the disclosure of this document, one of the appellant's employees reworked inventive blend 1. The relevant data are presented in declaration D4.

2.3.4 Specifically, D4 explains that the melt indexes $I_{10}$ and $I_2$ for the individual polymers used in the blend were measured. However, the melt indexes $I_{10}$ and $I_2$ of inventive blend 1 itself were not measured, due to a lack of material. Instead, the melt indexes $I_2$ and $I_{10}$ for inventive blend 1 were calculated using three different mixing equations taken from scientific publications D6, D7 and D8. All three equations gave practically identical results, as explained by a technical expert of the appellant in declaration D5.

2.3.5 For the following reasons, the board is not persuaded that D4 can be considered a true rework of the disclosure of inventive blend 1 of D3.

2.3.6 To begin with, although in D4 the melt indexes $I_2$ of the same polymers as in D3 were allegedly analysed, there is a manifest discrepancy in the measured values for both the final polymer composition of inventive example 1 and polymer FT5230 – the melt indexes $I_2$ disclosed in D3 are 1.5 g/10 min and 0.75 g/10 min, respectively, but the measured values disclosed in D4 are 1.4 g/10 min and 0.7 g/10 min, respectively. On this basis alone, it is not possible to unambiguously

establish that the reworked example entirely corresponds to inventive blend 1 of D3.

2.3.7 Moreover, as the opposition division correctly concluded, this discrepancy in turn influences further calculations, namely relating to the melt flow ratio $I_{10}/I_2$. The difference in the precision of the melt index $I_2$ of FT5230 used in the reworked example of D4, where only one decimal place is disclosed, has an impact on the calculated value $I_2$ that cannot be disregarded. In D3, the melt index $I_2$ of FT5230 is shown to two decimal places.

2.3.8 The respondent explained that when the values of the melt index $I_2$ disclosed in D3 for the individual polymers were used with the mixing equation of D8, the inequality ($I_{10}/I_2 \geq 7.0 - 1.2 \times \log (I_2)$) required by claim 1 was not satisfied. In its view, this cast further doubt on the appellant's line of argument.

2.3.9 The appellant argued that the difference found between the melt indexes for $I_2$ in D3 on one hand and in D4 on the other hand were within the margin of error. Only the values for the melt indexes for $I_2$ measured in D4 should be applied in the mixing equations; the melt indexes $I_2$ disclosed in D3 should not be considered in the calculations.

2.3.10 However, the calculation presented by the respondent illustrates that the prior-art disclosure of D3 does not directly and unambiguously disclose all the features of claim 1. A certain number of doubts or ambiguities arise when attempting to establish the (implicit) disclosure of D3. First, additional measurements are carried out in D4, but these show discrepancies compared with the prior-art disclosure of

D3. Next, melt indexes $I_2$ explicitly disclosed in the prior art D3 have to be disregarded. Furthermore, the measurements in D4 are used in empirical mixing equations to establish the melt indexes of the blend, rather than measuring the blend itself. And lastly, the results obtained still do not unambiguously fall within the range of claim 1.

2.3.11 In view of all this, it is not convincing that D3 unambiguously discloses all the features called for in claim 1, in particular the value expressed by the equation (or rather inequation) for the inner layer and feature (c). It follows from this that there is no apparent reason to set aside the opposition division's conclusion on novelty with respect to D3.

2.4 Therefore, the ground for opposition of Article 100(a) EPC in combination with Article 54 EPC does not prejudice the maintenance of the patent as granted.

3. *Main request – inventive step*

3.1 The opposition division concluded that the subject-matter of claim 1 involved an inventive step. In its decision, it discussed several embodiments of D1 as possible starting points for assessing inventive step and explained why D3 was not suitable as the closest prior art. In the opposition division's opinion, the film made with inventive composition 6 of D1 was the closest prior art because haze and gloss values were disclosed in connection with this composition. By contrast, no haze or gloss values were measured and disclosed for inventive composition 8 of D1.

3.2 Selection of the closest prior art

3.2.1 In view of the number of distinguishing features identified, the appellant argued that the closest prior art was inventive composition 8 of D1 rather than inventive composition 6. Furthermore, it argued that the subject-matter of claim 1 lacked an inventive step starting from inventive blend 1 of D3.

3.2.2 Like the opposition division, the respondent was of the opinion that the closest prior art was inventive composition 6. The purpose and effect of the invention in the patent in suit were directed to improved optics, namely low haze and high gloss. The appellant's choice of inventive composition 8 as the starting point was made with knowledge of the invention and based on hindsight.

3.2.3 Needless to say, hindsight should be avoided as far as possible when assessing inventive step. D1 addresses several aspects of ethylene-based blown films, including toughness. The focus of inventive composition 8 is on toughness and other mechanical properties. Optical properties are not mentioned in this context. Therefore, the board's view is that within the teaching of D1, an assessment directed at improving the optical properties of a multilayer film should in fact start from inventive composition 6.

3.2.4 In spite of this, and in favour of the appellant's line of argument, inventive step will be assessed using the disclosure of inventive composition 8 of D1 as the starting point.

3.2.5 As concerns the appellant's inventive-step argument starting from D3, the following observations are made.

3.2.6 At the oral proceedings before the opposition division, the opponent (now appellant) agreed that D1 was the closest prior art. Moreover, it did not present a line of argument starting from D3 at the oral proceedings; see the minutes (point 6) and the decision under appeal (Reasons for the decision, point 4.4.1.1). In its statement setting out the grounds of appeal, the appellant did not discuss why the opposition division had erred in concluding that D3 was not the closest prior art. As concerns the disclosure of D3 itself, this document does not refer to – let alone discuss – gloss of film, an effect sought in the patent in suit.

3.2.7 For completeness, it is also noted that the appellant's objection based on D3 hinges on information that is not derivable from the document itself. On the contrary, the appellant supplemented the disclosure of D3 with information regarding optical data taken from declaration D13, which was drafted by an employee of Borealis, the appellant. It is plain to see that D13 does not reflect what the skilled person would have learned from the disclosure of D3 itself at the effective date of the patent in suit. Therefore, D13 cannot be used to support the selection of D3 as a starting point.

3.2.8 To conclude, there is no discernible reason to consider D3 a starting point for assessing inventive step. An assessment starting from D3 would be less promising than an assessment starting from D1.

3.2.9 Therefore, as stated above, the board will assess inventive step starting from inventive composition 8 of D1.

3.3 Distinguishing feature and technical effect

3.3.1 Claim 1 differs from inventive composition 8 of D1 on account of feature (c): the first and second outer layers display a melt flow ratio, $I_{10}/I_2$, of from 6.0 to 7.6. As discussed above (see e.g. point 2.2.2), the ratio $I_{10}/I_2$ disclosed for inventive composition 8 of D1 is 7.7.

3.3.2 The appellant conceded that comparative film 1 of the patent in suit (made solely with resin 3) could be used for establishing the effect of the distinguishing feature. Resin 3 has a melt flow ratio $I_{10}/I_2$ of 8.1. It acknowledged that it was apparent from the data in table 6 of the patent in suit that the inventive films of the patent (for example inventive film 1) had a better gloss and lower haze, by comparison with comparative film 1.

3.3.3 Nevertheless, the appellant's view was that the effect was rather caused by the average molecular weight (Mz) of the polymer used in the inventive films. In this context it referred to table 5A of the patent in suit. This table discloses various parameters of the polymers used for preparing the comparative and inventive films, the optical data of which are displayed in table 6. According to the appellant, in light of the properties of the polymers in table 5A, no effect was shown to be caused solely by the distinguishing feature. It followed from this that the problem was to provide an alternative.

3.3.4 However, the difference observed regarding the Mz value (e.g. between inventive film 1 and comparative film 1 of the patent in suit) does not detract from the fact that an effect was demonstrated for the distinguishing

feature. Put another way, the distinguishing feature brings about the improved optical properties and there is no need to investigate whether other properties of the polymer composition of the film correlate with the effect. For completeness, it is observed that Mz is not a feature of claim 1, nor has it been argued that this parameter would be known to affect optical properties.

3.3.5 Therefore, the technical problem is to provide multilayer blown films with improved optical properties.

3.4 Non-obviousness

3.4.1 The appellant stated that optical properties were mentioned in the introductory portion of D1. Therefore, all the films of D1 displayed good optical properties. The appellant also referred to page 3, lines 7 and 9, and to inventive compositions 5 and 7 of D1, which all displayed a value for the melt flow ratio $I_{10}/I_2$ within the range called for in claim 1. In view of such teaching, the solution would have been obvious to the skilled person.

3.4.2 Contrary to the appellant's view, the skilled person would have had no motivation to modify or lower the melt flow ratio $I_{10}/I_2$ disclosed in the closest prior art considered, i.e. inventive composition 8. While D12 does mention melt flow ratios falling within the range called for in claim 1, there is no indication that the ratio is associated with advantageous haze and gloss properties. As discussed earlier in the context of selecting the closest prior art, the starting point does not mention the haze or gloss of the film.

3.4.3 Analogous considerations apply with respect to the disclosure of inventive compositions 5 and 7 of D1, which concern monolayer films made from a single layer. These two compositions would not have pointed the skilled person towards a solution to the technical problem.

3.4.4 Thus, the suggested solutions required by claim 1 would not have been obvious for the skilled person starting from inventive composition 8 of D1.

3.5 For completeness, the appellant did not present any arguments against the opposition division's conclusion that the subject-matter of claim 1 involved an inventive step starting from inventive composition 6 of D1. The board agrees with this conclusion and sees no reason to review it.

3.6 To conclude, the ground for opposition of Article 100(a) EPC in combination with Article 56 EPC does not prejudice the maintenance of the patent as granted.

**Order**

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

The appeal is dismissed.

The Registrar: The Chairman:

K. Götz-Wein A. Haderlein

Decision electronically authenticated