

Internal distribution code:

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

**Datasheet for the decision
of 19 November 2025**

Case Number: T 1733/23 - 3.3.03

Application Number: 17792051.9

Publication Number: 3545006

IPC: C08F2/00, C08L23/06

Language of the proceedings: EN

Title of invention:

POLYETHYLENE COMPOSITION FOR BLOW MOLDING HAVING HIGH STRESS
CRACKING RESISTANCE

Patent Proprietor:

Basell Polyolefine GmbH

Opponent:

Borealis GmbH

Relevant legal provisions:

EPC Art. 54, 56

RPBA 2020 Art. 13(2)

Keyword:

Amendment after summons - exceptional circumstances (no)

Novelty - main request (yes)

Inventive step - all requests (no)

Decisions cited:

G 0001/03, G 0002/10, G 0001/16, T 0026/85, T 0035/85,
T 0197/86, T 0939/92, T 1323/17



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 1733/23 - 3.3.03

D E C I S I O N
of Technical Board of Appeal 3.3.03
of 19 November 2025

Appellant 1: Basell Polyolefine GmbH
(Patent Proprietor) Brühler Strasse 60
50389 Wesseling (DE)

Representative: LyondellBasell
c/o Basell Poliolefine Italia
Intellectual Property
P.le Donegani 12
44122 Ferrara (IT)

Appellant 2: Borealis GmbH
(Opponent) Trabrennstrasse 6-8
1020 Vienna (AT)

Representative: Dehns
10 Old Bailey
London EC4M 7NG (GB)

Decision under appeal: **Interlocutory decision of the Opposition
Division of the European Patent Office posted on
19 July 2023 concerning maintenance of the
European Patent No. 3545006 in amended form.**

Composition of the Board:

Chairman D. Semino
Members: O. Dury
W. Ungler

Summary of Facts and Submissions

- I. The appeals of the patent proprietor and of the opponent lie from the interlocutory decision of the opposition division concerning maintenance of European patent No 3 545 006 in amended form according to the claims of auxiliary request 1, which was filed as auxiliary request 2 with letter of 10 January 2022, and an adapted description (including one figure).
- II. The following documents were, among others, cited in the decision under appeal:
- D1: WO 2014/206854 A1
D3: Environmental Stress Crack Resistance of Polyethylene, INEOS Olefins & Polymers USA, 2008
D13: US 2014/0243475 A1
- III. The decision under appeal was based on the patent as granted as main request and on the above mentioned auxiliary request 1. As far as relevant to the present decision, the following conclusions were reached by the opposition division in that decision:
- Whereas the subject-matter of claim 1 of the main request was novel over the disclosure of D1, it did not involve an inventive step when D1 was taken as the closest prior art.
 - The subject-matter of claim 1 of auxiliary request 1 involved an inventive step when D1 was taken as the closest prior art.

For these reasons and further considering that none of the other objections raised by the opponent were successful, the patent as amended on the basis of the claims of auxiliary request 1 was held to meet the requirements of the EPC.

- IV. The patent proprietor (appellant 1) and the opponent (appellant 2) both lodged an appeal against this decision.
- V. With their rejoinder to the statement of grounds of appeal of appellant 2, appellant 1 filed several sets of claims as auxiliary requests.
- VI. The parties were summoned to oral proceedings and a communication dated 30 May 2025 indicating specific issues to be discussed at the oral proceedings was then sent to the parties.
- VII. With letter of 31 July 2025 appellant 1 further filed the following document:
- D14: WIRES Comput. Mol. Sci., 2012, 2: 221-241
- VIII. Oral proceedings were held on 19 November 2025 in the presence of both parties.
- IX. The **final requests** of the parties were as follows:
- (a) Appellant 1 requested that the decision of the opposition division be set aside and the opposition be rejected (main request) or, in the alternative, that the patent be maintained in amended form on the basis of any of auxiliary requests 2, 5 or 10 filed with their rejoinder to the statement of

grounds of appeal of appellant 2.

(b) Appellant 2 requested that the decision under appeal be set aside and the patent be revoked.

X. Claims 1 and 5 of the **main request** (patent in suit) read as follows:

"1. A polyethylene composition having the following features:

1) density from greater than 0.952 to 0.957 g/cm³, preferably from 0.953 to 0.957 g/cm³, more preferably from 0.953 to 0.956 g/cm³, determined according to ISO 1183 at 23°C;

2) ratio MIF/MIP from 12 to 25 in particular from 15 to 22, where MIF is the melt flow index at 190°C with a load of 21.60 kg, and MIP is the melt flow index at 190°C with a load of 5 kg, both determined according to ISO 1133-1;

3) MIF from 18 to 40 g/10 min., preferably from 20 to 40 g/10 min.;

4) $\eta_{0.02}$ from 30,000 to 55,000 Pa.s, preferably from 36,000 to 55,000 Pa.s., more preferably from 36,000 to 50,000 Pa.s.; wherein $\eta_{0.02}$ is the complex shear viscosity at an angular frequency of 0.02 rad/s, measured with dynamic oscillatory shear in a plate-plate rotational rheometer at a temperature of 190°C;

5) long-chain branching index, LCBI, equal to or greater than 0.55, preferably equal to or greater than 0.60, wherein LCBI is the ratio of the measured mean-square radius of gyration R_g , measured by GPC-MALLS, to the mean-square radius of gyration for a linear PE

having the same molecular weight;

6) ratio $(\eta_{0.02}/1000)/LCBI$, which is between $\eta_{0.02}$ divided by 1000 and LCBI, from 55 to 75, preferably from 55 to 70."

"5. The polyethylene composition of claim 1, having the following additional feature:

- HMWcopo index from 0.5 to 5;

wherein the HMWcopo index is determined according to the following formula:

$$HMWcopo = (\eta_{0.02} \times t_{maxDSC}) / (10^5)$$

where $\eta_{0.02}$ is the complex viscosity of the melt in Pa.s, measured at a temperature of 190°C, in a parallel-plate (or so-called plate-plate) rheometer under dynamic oscillatory shear mode with an applied angular frequency of 0.02 rad/s; the t_{maxDSC} is the time, in minutes, required to reach the maximum value of heat flow (in mW) of crystallization (time at which the maximum crystallization rate is achieved, equivalent to the $t_{1/2}$ crystallization half-time) at a temperature of 124 °C under quiescent conditions, measured in isothermal mode in a differential scanning calorimetry apparatus, DSC;."

XI. Claim 1 of **auxiliary request 2** differed from claim 1 of the main request in that the definition of feature 4) was amended as follows (deletions in ~~striketrough~~):

"4) $\eta_{0.02}$ ~~from 30,000 to 55,000 Pa.s,~~ preferably from 36,000 to 55,000 Pa.s., more preferably from 36,000 to 50,000 Pa.s.; wherein $\eta_{0.02}$ is the complex shear

viscosity at an angular frequency of 0.02 rad/s, measured with dynamic oscillatory shear in a plate-plate rotational rheometer at a temperature of 190°C;"

XII. Claim 1 of **auxiliary request 5** corresponded to claim 5 of the main request, whereby the HMWcopo index was referred to as feature 7) and the higher end of the range of the HMWcopo index was limited to 3 (instead of 5).

XIII. Claim 1 of **auxiliary request 10** differed from claim 1 of auxiliary request 2 in that the definition of the polyethylene composition preceding the list of features 1) to 6) was amended as follows (additions in **bold**):

"1. A polyethylene composition **comprising**:

A) 30 - 70% by weight of an ethylene homopolymer or copolymer (the homopolymer being preferred) with density equal to or greater than 0.960 g/cm³ and melt flow index MIE at 190°C with a load of 2.16 kg, according to ISO 1133, of 40 g/10 min. or higher, preferably of 50 g/10 min. or higher;

B) 30 - 70% by weight of an ethylene copolymer having a MIE value lower than the MIE value of A), preferably lower than 0.5 g/10 min.;

said composition having the following features:"

XIV. The parties' submissions, in so far as they are pertinent, may be derived from the reasons for the decision below. The points of dispute that are relevant for the present decision are the following ones:

- The admittance into the proceedings of document D14.
- The issue of novelty of the subject-matter of claim 1 of the main request over the disclosure of document D1.
- The question of inventive step of the subject-matter of claim 1 of the main request and of claim 1 of each of auxiliary requests 2, 5 and 10 when D1 was taken as the document constituting the closest prior art.

Reasons for the Decision

Main request - Patent as granted

1. Admittance of document D14
 - 1.1 Document D14 was filed by appellant 1 for the first time with their letter of 31 July 2025. Since D14 was submitted after receipt of the Board's communication, the admittance of this document is governed by Article 13(2) RPBA, according to which any amendment to a party's appeal case is, in principle, not taken into account unless there are exceptional circumstances, which have been justified with cogent reasons by the party concerned.
 - 1.2 According to appellant 1, D14 was filed in support of their argument that the control of long chain branching generation with coordination catalysts was well known in the art at the priority/filing date of the patent in suit (letter of appellant 1 of 31 July 2025: bottom of

page 8). Appellant 1 put forward that D14 should be admitted because it had been filed in order to address concerns expressed by the Board in its communication as to the question if feature 6) of granted claim 1 could be obtained over the whole breadth of the range specified therein in view of the patent specification, in particular its examples, and common general knowledge. In addition, appellant 1 pointed out that D14 merely supported the view that they had defended until then that the skilled person knew how to control long chain branching and, therefore, how to manipulate the LCBI feature contained in said feature 6) (letter of appellant 1 of 31 July 2025: bottom of page 8 to middle of page 9).

- 1.2.1 However, it is established case law that a Board's preliminary opinion that is based exclusively on the parties' submissions cannot justify the late submission of a new document (Case Law of the Boards of Appeal of the EPO, 11th edition, 2025, V.A.4.5.5.a and f). In that respect, it was neither shown, nor even argued (in particular during the oral proceedings before the Board), that D14 had been filed in reaction to a new issue raised for the first time in the Board's communication. To the contrary, as put forward by appellant 2 (letter of 5 November 2025: point 24), the question if the skilled person knew how to manipulate LCBI that was relied upon by appellant 1 to justify the filing of D14 was already at stake since the outset of the opposition proceedings (see e.g. points 4-9 of the notice of opposition) and was continuously pursued by appellant 2 in appeal (see e.g. their statement of grounds of appeal: points 5-9, 15-18, 20; their rejoinder to the statement of grounds of appeal of appellant 1: points 16 and 17). In these circumstances, appellant 1 would have had good reasons to file D14

earlier in the proceedings if they intended to rely on it and the issue addressed in the Board's communication mentioned by appellant 1 cannot justify the filing of D14 at such a late stage of the proceedings.

1.2.2 In addition, the Board does not agree that D14 only supports the previous line of defence of appellant 1. As pointed out by appellant 2 during the oral proceedings before the Board, appellant 1 for instance mentioned in their written submissions that D14 showed that LCBI could be controlled by various means such as macromers or postprocessing (letter of 31 July 2025: first half of page 9), which had not been argued before. In that respect, it is established case law that it is a matter for each party to submit all facts, evidence, arguments and requests relevant for the enforcement or defence of its rights as early and completely as possible, in particular in *inter partes* proceedings, in order to act fairly towards the other party and, more generally, to ensure due and swift conduct of the proceedings (Case Law, *supra*, V.A.4.1.2). However, in view of the above consideration, the filing of D14 at such a late stage of the appeal proceedings is not in accordance with this well established principle.

1.2.3 The Board further considers that it is derivable from Article 13(2) RPBA that the decisive criteria regulating the admittance of a document filed for the first time after the Board's communication was dispatched to the parties are primarily of procedural nature, i.e. the question to be answered is if the circumstances of the case may justify the filing of a new document at such a late stage of the proceedings. However, for the reasons indicated above, the Board

concluded that this is not the case here.

1.3 During the oral proceedings before the Board, appellant 1 further argued that D14 should be admitted because its filing did not constitute an amendment to their case. In addition, considering that this document was merely filed to illustrate what the common general knowledge of the skilled person regarding LCBI was at the priority/filing date of the patent in suit, there was no reason to disregard it, so appellant 1.

1.3.1 However, the Board disagrees with the view of appellant 1 that the filing of D14 does not constitute an amendment of their case since, pursuant to Article 12(4), first sentence, RPBA (which also applies to Article 13(2) RPBA according to established case law, see e.g. Case Law, *supra*, V.A.4.5.1.a, last paragraph and the explanatory remarks on Article 13(2) RPBA contained in CA/3/19, section VI), it makes no doubt that a document that is filed for the first time in appeal constitutes an amendment to a party's case. For that reason alone, the argument of appellant 1 is rejected.

1.3.2 In addition, in the circumstances of the present case (see section 1.3 above), the question whether or not D14 constitutes common general knowledge, which was a point of dispute between the parties during the oral proceedings before the Board, is not relevant for the decision on the admittance of this document at the present stage of the appeal proceedings and can, therefore, remain unanswered. For the sake of completeness, it should be noted that evidence relating to common general knowledge is also subject to the same provisions governing the admittance of amendments to

the case.

1.4 In view of the above, the Board cannot recognise any exceptional circumstances justifying the submission of D14 at such a late stage of the appeal proceedings. Therefore, the Board decided not to take D14 into account pursuant to Article 13(2) RPBA.

2. Article 54 EPC - Novelty over D1

2.1 Appellant 2 disagreed with the conclusion reached in the decision under appeal according to which the subject-matter of claim 1 as granted was novel over the disclosure of D1 because the combination of features according to said claim 1, in particular the combination of features 1), 4) and 6) in the ranges specified therein, could only be arrived at after making a series of selections within the ambit of D1 (reasons: point 3).

2.2 In that respect, according to established case law, the concept of disclosure must be the same for the purpose of Article 54 EPC as the one for Article 123(2) EPC (see G 2/10: Reasons 4.6 and 4.3; G 1/03: Reasons 2.2.2 and G 1/16: Reasons 17). Accordingly it has to be shown that the subject-matter being claimed, in particular the specific combination of the three features 1), 4) and 6) of granted claim 1 that were considered by the opposition division, is directly and unambiguously disclosed in the prior art (so-called gold standard, as referred to in G 2/10).

2.3 The objection of appellant 2 started from the disclosure of claim 2, dependent on claim 1, of D1, whereby these claims read as follows:

"1. Polyethylene composition having the following features:

- 1) density from more than 0.948 to 0.955 g/cm³, preferably from 0.949 to 0.954 g/cm³, determined according to ISO 1183 at 23°C;
- 2) ratio MIF/MIP from 12 to 25, in particular from 15 to 23, where MIF is the melt flow index at 190°C with a load of 21.60 kg, and MIP is the melt flow index at 190°C with a load of 5 kg, both determined according to ISO 1133;
- 3) MIF from 25 to 40 g/10 min., preferably from 30 to 35 g/10 min., in particular from 31 to 35 g/10 min.;
- 4) Mz from 1000000 to 2000000 g/mol, preferably from 1000000 to 1500000 g/mol, more preferably from 1000000 to 1450000 g/mol;
- 5) long-chain branching index, LCBI, equal to or greater than 0.55, preferably equal to or greater than 0.60;
wherein LCBI is the ratio of the measured mean-square radius of gyration R_g, measured by GPC-MALLS, to the mean-square radius of gyration for a linear PE having the same molecular weight."

"2. The polyethylene composition of claim 1, additionally having:

- 6) eta (0.02) from 25,000 to 35,000 Pa.s, preferably from 28,000 to 33,000 Pa.s.;
- wherein eta (0.02) is the complex shear viscosity at an angular frequency of 0.02 rad/s, measured with dynamic oscillatory shear in a plate-plate rotational rheometer

at a temperature of 190°C."

2.4 On that basis, starting from claim 2 of D1 as was done by appellant 2 (letter of 6 February 2024: point 89), the following choices would have to be made in order to arrive at the subject-matter of claim 1 as granted:

- A specific value of density within the ranges of feature 1) of claim 1 of D1 (in order to arrive at feature 1) of claim 1 as granted);
- A specific value of complex shear viscosity $\eta_{0.02}$ within the ranges of feature 6) of claim 2 of D1 (in order to arrive at feature 4) of claim 1 as granted);
- A specific value of the ratio $(\eta_{0.02}/1000)/LCBI$ within the ranges that can be calculated from the values of features 5) and 6) of claims 1 and 2 of D1 (in order to arrive at feature 6) of claim 1 as granted; **this feature will be referred to as feature "eta/LCBI" hereinafter**). As indicated in the decision under appeal, the broadest range for the feature eta/LCBI that is derivable from claims 1 and 2 of D1 is from 25 to 63.6 (reasons: bottom of page 6).

However, the Board agrees with the opposition division that it was not shown that there was any pointer in D1 to the specific combination of features 1) to 6) being claimed, in particular to the combination of the above three features 1), 4) and 6), in the specific ranges specified in granted claim 1.

2.5 Appellant 2 argued that novelty over D1 was not given because the skilled person would have seriously

contemplated preparing a composition according to claim 1 as granted (letter of 6 February 2024: points 90-97, with reference to decision T 26/85).

However, the Board considers that it cannot be concluded from the disclosure of D1 that the combination of features 1), 4) and 6) in the specific ranges specified in granted claim 1 is for any reasons prominent to such an extent that a polyethylene as defined in claim 1 as granted may be seen to be directly and unambiguously disclosed therein. This is in particular true for the combination of features relied upon by appellant 2 in point 94 of their rejoinder to the statement of grounds of appeal of appellant 1 (see rejoinder of appellant 1: page 9, first half). In these circumstances, the arguments of appellant 2 related to decision T 26/85 did not convince.

- 2.6 The above considerations were indicated to the parties in the Board's communication (section 6) and remained undisputed by appellant 2 in the subsequent course of the proceedings (both in writing or during the oral proceedings before the Board). In these circumstances, there is no reason for the Board to deviate from its preliminary opinion.
- 2.7 In these circumstances, the arguments of appellant 2 do not justify that the Board overturns the decision of the opposition division regarding novelty of granted claim 1 over D1.
3. Article 56 EPC - Inventive step over example 1 of D1
- 3.1 Closest prior art and distinguishing features

- 3.1.1 It was common ground that D1 is a suitable document to be taken as the closest prior art and that example 1 thereof is particularly relevant and can be taken as starting point for the assessment of inventive step.
- 3.1.2 It was also undisputed (statement of grounds of appeal of appellant 1: page 6, section 4, first five subparagraphs; rejoinder of appellant 2: point 103) that the subject-matter of claim 1 as granted differs from the polyethylene composition according to example 1 of D1 in the following features:
- The density according to feature 1) of claim 1 as granted should be between 0.952 and 0.957 g/cm³ (whereas the polyethylene according to example 1 of D1 has a density of 0.950 g/cm³);
 - The eta/LCBI feature according to feature 6) of claim 1 as granted should be between 55 and 75 (whereas it can be calculated from the data of table 1 of D1 that eta/LCBI for the polyethylene according to example 1 of D1 is 44.3).
- 3.1.3 The Board has no reason to be of a different opinion. Therefore, the subject-matter of granted claim 1 differs from the polyethylene composition according to example 1 of D1 in that it exhibits higher values in terms of both density (feature 1)) and eta/LCBI (feature 6)).
- 3.2 Problem solved over example 1 of D1
- 3.2.1 The parties disagreed how the problem effectively solved is to be formulated, whereby it was in particular in dispute if either example 1 of D1 or example 1 of D13 was to be considered in order to allow

a fair comparison.

a) Appellant 1 proposed different formulations of the technical problem effectively solved depending on which comparative example was relied upon. According to appellant 1, a fair comparison could only be done between polyethylene compositions with similar densities since it was well known in the art (see e.g. D3) that density had a strong impact on environmental stress crack resistance, which was one of the crucial property to be achieved by the compositions being claimed. On that basis, appellant 1 considered that examples 1 and 2 of the patent in suit could not be fairly compared with example 1 of D1 - as was done by appellant 2 - in view of the significant difference in density of these polymers. Rather, according to appellant 1, a fair comparison would have to be done between examples 1 and 2 of the patent in suit and example 1 of D13, which examples were all directed to polyethylene compositions having similar densities.

Should example 1 of D13 be taken as comparison, appellant 1 considered that, as shown e.g. in the table on page 3 of their letter of 31 July 2025, the objective problem solved resided in the provision of polyethylene compositions with improved environmental stress crack resistance (determined as FNCT according to paragraphs 93-94 of the patent in suit) and a swell ratio higher than 170%. In doing so, appellant 1 pointed out that they adhered to the finding of the opposition division when assessing inventive step in view of D13 (see page 13 of the decision under appeal; statement of grounds of appeal of appellant 1: middle of page 7; oral proceedings before the Board).

Should example 1 of D1 be taken as comparison as was

done by appellant 2 (which was considered by appellant 1 not to be correct), the objective problem solved resided in the provision of a polyethylene composition with an improved balance of properties between environmental stress crack resistance (FNCT), swell ratio, fracture toughness at -30°C (Charpy aCN determined according to paragraphs 95-96 of the patent in suit) together with a low gel content (statement of grounds of appeal: section 3; see in particular the table on page 4 and the improvements relied upon at the top of page 5; see also the passage bridging pages 5 and 6). Appellant 1 further noted that the polyethylene compositions according to examples 1 and 2 of the patent in suit further exhibited improved Tensile Notch Impact resistance at -30°C with respect to the one according to example 1 of D1 (statement of grounds of appeal: page 7, fourth paragraph from the bottom; oral proceedings before the Board).

b) To the contrary, appellant 2 argued that the comparison of examples 1 and 2 of the patent in suit with example 1 of D1 was allowable but did not show that any of the technical effects relied upon by appellant 1 was effectively achieved. To the contrary, this comparison rather showed that the polymers according to granted claim 1 had a worse balance of properties than the one according to example 1 of D1, notably a significantly lower environmental stress crack resistance (FNCT). In addition, the comparison of examples 1 and 2 of the patent in suit with example 1 of D13 was not suitable because the latter did not illustrate the disclosure of the closest prior art constituted by example 1 of D1 (letter of 5 November 2025: point 72; oral proceedings before the Board). Therefore, no improvement over the closest prior art had been shown and the problem solved over

example 1 of D1 resided in the mere provision of a further, alternative polyethylene with good ESCR and good gel content (rejoinder to the statement of grounds of appeal of appellant 1: points 104, 108).

Comparison with example 1 of D1

- 3.2.2 According to established case law, an advantageous effect demonstrated in a comparative test can be taken as an indication of inventive step. However, if comparative tests are chosen to demonstrate an inventive step on the basis of an improved effect over a claimed area, care should nevertheless be taken that the nature of the comparison with the closest state of the art is such that the alleged advantage or effect is convincingly shown to have its origin in the distinguishing feature of the invention compared with the closest state of the art (Case Law, *supra*, I.D.4.3.2).
- 3.2.3 In the present case, it was common ground between the parties during the oral proceedings before the Board that the polymer prepared in example 1 of D1 and in examples 1 and 2 of the patent in suit were prepared using very similar preparation processes and catalyst systems (both documents are in the name of appellant 1 and have inventors in common; the descriptions of both documents are also very similar). Although it is correct that the polymers prepared in examples 1 and 2 of the patent in suit differ from the one of example 1 of D1 in further features on top of the two distinguishing features indicated in point 3.1.2 above (see e.g. melt flow rates MIP and MIF, molecular weights M_w and M_z , polydispersity MIF/MIP and M_w/M_n , comonomer content reported in the table on page 3 of the letter of appellant 1 dated 31 July 2025), it has

to be taken into account that it is known in the art that many of these features are interrelated, so that modifying one of these features may be expected to have an impact on the other features of the polymer being prepared. This renders it difficult to make a truly fair comparison between two polymers that differ only in the distinguishing features identified above. On that basis, the Board is of the opinion that a comparison of examples 1 and 2 of the patent in suit with example 1 of D1 can be considered to assess if any effect(s) can be attributed to the distinguishing features indicated in above point 3.1.2.

3.2.4 The properties of the polymers prepared in example 1 of D1 and in examples 1 and 2 of the patent in suit were presented by appellant 2 in the following table (statement of grounds of appeal: point 117; "D1", "Ex 1" and "Ex 2" refer to example 1 of D1 and examples 1 and 2 of the patent in suit, respectively):

Parameter	D1	Opposed Patent – Ex 1	Opposed Patent – Ex 2
FNCT 4 MPa	40 hrs	11 hrs	6 hrs
Charpy can	6 kJ/m ²	4.9 kJ/m ²	5.6 kJ/m ²
Tensile Notch Impact	78 kJ/m ²	83.4 kJ/m ²	85.9 kJ/m ²
Swell ratio	182	186	177

whereby:

- FNCT is environmental stress crack resistance;
- Charpy aCN (erroneously reported as "can" in the above table) is fracture toughness at -30°C;

- Tensile Notch Impact is tensile impact strength at -30°C.

a) It was undisputed that all these properties were determined under the same conditions in D1 and in the patent in suit and could be directly compared with each other. On that basis, it is derivable from the data of this table that the polymers prepared in examples 1 and 2 of the patent in suit exhibit significantly lower environmental stress crack resistance properties (FNCT) than the one of example 1 of D1. Also, in view of the significant difference in terms of these results (40 hrs vs. 11 or 6 hrs), the Board considers that it is highly questionable that such a difference can be solely explained by the difference in terms of density of these polymers as implied by appellant 1 and, in view of the evidence on file, rather shares the view of appellant 2 that this is not the case (statement of grounds of appeal: point 121; letter of 5 November 2025: point 67). Although appellant 1 put forward that, should the density of the polymer prepared in example 1 of D1 be modified to values of equal to or higher than 0.952 g/cm^3 , in particular to a value similar to the one of examples 1 and 2 of the patent in suit, it would not be possible to achieve the balance of environmental stress crack resistance (FNCT) and impact resistance as good as the one reported in examples 1 and 2 of the present patent (see e.g. statement of grounds of appeal: section 4, page 6, second sentence; oral proceedings before the Board), no evidence in that respect was submitted. Therefore, this argument is speculative and, in view of the significant difference in terms of environmental stress crack resistance shown in the above table, did not convince. In addition, for the same reason, the Board considers that this difference in density between example 1 of D1

and examples 1 and 2 of the patent in suit does not justify that these examples cannot be compared with each other to assess the effect in terms of environmental stress crack resistance that can be attributed to the distinguishing features indicated in above point 3.1.2 (one of them being indeed the density).

b) The Board further considers that the above table (see point 3.2.4) also shows that the polymers prepared in examples 1 and 2 of the patent in suit do not exhibit an improved balance of properties in terms of environmental stress crack resistance (FNCT), swell ratio, fracture toughness (Charpy aCN) and tensile impact strength (Tensile Notch Impact) as compared to the one according to example 1 of D1. To the contrary, these data rather show that the polymer prepared in any of examples 1 and 2 of the patent in suit has a significantly lower environmental stress crack resistance (FNCT), slightly lower Charpy aCN, similar swell ratio and impact strength, and slightly higher Tensile Notch Impact, which, in the Board's view, provides a worse balance of properties than the one of example 1 of D1 (i.e. the comparative example), as put forward by appellant 2 (statement of grounds of appeal: points 118-119; letter of 6 February 2024: point 117). The Board in particular considers that a slight increase in terms of Tensile Notch impact accompanied by a simultaneous major decrease in environmental stress crack resistance and slight decrease in Charpy aCN properties (as compared to example 1 of D1) does not amount to an improved balance of properties, in particular when taking into account that, according to the patent specification, the main aim was to provide high environmental stress crack resistance (title; paragraph 3; see also paragraph 24, in which in

addition to environmental stress crack resistance, good swell ratio, Charpy and absence of gel are indicated as preferred properties aimed at, whereby Tensile Notch impact is not mentioned).

- 3.2.5 For these reasons, the Board considers that the comparison of examples 1 and 2 of the patent in suit with example 1 of D1 does not show that the distinguishing features indicated in above section 3.1.2 are related to an improved balance of properties as argued by appellant 1.

Comparison with example 1 of D13

- 3.2.6 It is also established case law that the patent proprietor (here, appellant 1) may discharge their onus of proof by voluntarily submitting comparative tests with newly prepared variants of the closest state of the art identifying the features common with the invention, in order to have a variant lying closer to the invention so that the advantageous effect attributable to the distinguishing feature is thereby more clearly demonstrated (Case Law, *supra*, I.D.4.3.2; see in particular T 35/85: section 4 of the reasons, and T 197/86: section 6.1.3 of the reasons). On that basis, comparative tests do not always have to be carried out using the closest prior art. However, what is ultimately of relevance is not only whether a causal link between a distinguishing feature over the closest prior art and an effect is demonstrated within the framework of a comparative test submitted by the patent proprietor. It also counts whether the variant of the closest prior art selected as a reference (or comparative) example for the comparative test is representative of the closest prior art, in the sense that the effect shown to be caused by the

distinguishing feature in the context of the comparative test can be expected to take place also within the framework of the closest prior art despite the existence of differences vis-à-vis the reference example of the comparative test (Case Law, *supra*, I.D.4.3.2, see in particular the reference to T 1323/17 and point 5.1 of the reasons of this decision).

3.2.7 In this respect, regarding the comparison of examples 1 and 2 of the patent in suit (according to claim 1 as granted) with example 1 of D13 (comparative example) that was relied upon by appellant 1 in view of their similar density, it was common ground between the parties during the oral proceedings before the Board that the polymer prepared in example 1 of D13 and in examples 1 and 2 of the patent in suit were prepared using very similar preparation processes and catalyst systems (both documents are in the name of appellant 1 and have inventors in common; the descriptions of both documents are also very similar). Therefore, the disclosures of example 1 of D1 and example 1 of D13 are quite similar and provide no cause for the Board to disregard example 1 of D13 already for the reason that it does not constitute a suitable variant of the disclosure of example 1 of D1.

3.2.8 However, the Board agrees with appellant 2 that, as is derivable from the table on page 3 of the letter of appellant 1 of 31 July 2025, the polyethylene prepared in example 1 of D13 differs from the one according to example 1 of D1 *inter alia* in that it exhibits a much higher eta/LCBI value (79 vs. 44.3) and lower LCBI value (0.53 vs. 0.69) (rejoinder: point 106; letter of 5 November 2025: point 72; oral proceedings before the Board). In particular, while example 1 of D13 does not differ from examples 1 and 2 of the patent in suit in

view of the density (although it is one of the distinguishing features identified in point 3.1.2 above), it differs therefrom in terms of eta/LCBI in an opposite manner with respect to example 1 of D1: whereas eta/LCBI of example 1 of D1 is lower than the lowest value specified in granted claim 1 (see feature 6)), the value of example 1 of D13 is higher than the highest value specified in granted claim 1 (eta/LCBI of example 1 of D1 is 44.3; range of the eta/LCBI feature 6) of granted claim 1 is from 55 to 75; eta/LCBI of example 1 of D13 is 79). In these circumstances, the Board agrees with appellant 2 and with the opposition division (top of page 11 of the decision under appeal) that it cannot be considered that any conclusion that would be reached from the comparison of examples 1 and 2 of the patent in suit with example 1 of D13 is also necessarily valid for a comparison of examples 1 or 2 of the patent in suit with example 1 of D1. On the contrary, the comparison of the available data (which in particular show that example 1 of D1 has the lowest eta/LCBI value and the highest environmental stress crack resistance/FNCT, while example 1 of D13 has the highest eta/LCBI value and lowest environmental stress crack resistance/FNCT) tends to show that the most relevant property in the patent in suit is not improved with respect to example 1 of D1, but is likely to get worse. For that reason, the Board considers that example 1 of D13 is not representative of the closest prior art constituted by example 1 of D1 and that the comparison of examples 1 and 2 of the patent in suit with example 1 of D13 is not suitable to demonstrate that any technical effect (in particular the ones relied upon by appellant 1) was convincingly shown to be effectively related to the distinguishing feature eta/LCBI. For these reasons, the arguments of appellant 1 based on

the comparison of the examples of the patent in suit with example 1 of D13 are rejected.

Objective technical problem

- 3.2.9 Regarding the properties of the polyethylene being claimed relied upon by appellant 1, it was undisputed that, as already held in the decision under appeal (page 9, third to sixth lines), D1 is directed to polyethylenes that exhibit good environmental stress crack resistance and low gel contents. The Board has no reason to be of a different opinion (D1: page 1, line 10; page 3, line 34). Therefore, the Board is satisfied that the polyethylene composition prepared in D1, in particular in example 1 thereof, exhibit good environmental stress crack resistance properties and gel content as do the ones of the patent in suit.
- 3.2.10 In view of the above, it is agreed with appellant 2 that the problem effectively solved by claim 1 as granted resides in the provision of another polyethylene with good environmental stress crack resistance and good gel content, in alternative to the one of D1 (statement of grounds of appeal of appellant 2: point 111; oral proceedings before the Board).
- 3.3 Obviousness
- 3.3.1 The question remains to be answered if the skilled person, desiring to solve the problem identified as indicated above, would, in view of the closest prior art, possibly in combination with other prior art or with common general knowledge, have modified the disclosure of the closest prior art in such a way as to

arrive at the claimed subject matter.

3.3.2 In this respect, it remained undisputed by appellant 1 during the oral proceedings before the Board that:

- The range of density, MIF/MIP, MIF, and LCBI according to features 1) to 3) and 5) of granted claim 1 overlapped with the respective ranges of these features specified in e.g. claim 1 of D1;
- While the range of complex shear viscosity $\eta_{0.02}$ according to feature 4) of granted claim 1 overlapped with the range of complex shear viscosity $\eta_{0.02}$ specified in claim 2 of D1, the range of eta/LCBI according to feature 6) of granted claim 1 overlapped with the broadest range of eta/LCBI that was derivable from the ranges of LCBI and complex shear viscosity $\eta_{0.02}$ specified in claims 1 and 2, respectively of D1 (which was indicated to be between 25 and 63.6 in point 3, at the bottom of page 6 of the decision under appeal).

The Board has no reason to deviate from these views. Therefore, it is concluded that a polyethylene composition satisfying features 1) to 6) according to granted claim 1, although it is not directly and unambiguously disclosed in D1, is nevertheless within the ambit of the disclosure of D1.

3.3.3 During the oral proceedings before the Board, appellant 1 confirmed to the Chairman that their single line of defence was based on the achievement of an improvement over D1 and that they agreed that, should the problem solved over example 1 of D1 be held to reside in the provision of an alternative to D1, the subject-matter of granted claim 1 would be obvious. In

particular, appellant 1 explicitly agreed that the skilled person would have had no difficulty, on the basis of the information provided in D1 and common general knowledge, to modify example 1 of D1 so as to arrive at a polyethylene composition satisfying the combinations of features 1) to 6) according to granted claim 1 that was encompassed by the disclosure of D1. In these circumstances and further considering that the objective problem resides in the mere provision of another polyethylene with good environmental stress crack resistance and good gel content, in alternative to the one of D1, the Board considers that the skilled person starting from example 1 of D1 as the closest prior art would have arrived at a polyethylene composition according to granted claim 1 without any inventive activity.

- 3.3.4 In view of the above, the subject-matter of granted claim 1 does not involve an inventive step when example 1 of D1 is taken as the closest prior art and the main request, as a whole, is not allowable.

Auxiliary request 2

4. Claim 1 of auxiliary request 2 differs from claim 1 of the main request in that the lower end of the range specified for feature 4) (complex shear viscosity $\eta_{0.02}$) was amended, so that the range was limited to "from 36,000 to 55,000 Pa.s" (instead of "from 30,000 to 55,000 Pa.s").
5. Inventive step in view of example 1 of D1
- 5.1 It was common ground that claim 1 of auxiliary request 2 was identical to claim 1 of auxiliary request 1 that had been allowed by the opposition

division. The opposition division in particular decided that the subject-matter of said claim 1 involved an inventive step when example 1 of D1 was taken as the closest prior art because there was no generic disclosure in D1 that the complex shear viscosity $\eta_{0.02}$ could be in the range now defined in claim 1 of auxiliary request 2 (reasons: point 7.1).

5.2 It was common ground between the parties during the oral proceedings before the Board that, in view of the decision taken by the Board regarding inventive step of the main request, the following findings of the opposition division applied to claim 1 (reasons: point 7.1, top of page 12):

- As a consequence of the amendment made in operative claim 1 and considering that the value of complex shear viscosity $\eta_{0.02}$ that was disclosed in table 1 of D1 for example 1 was 30,570 Pa.s, the subject-matter now being claimed additionally differed from the disclosure of example 1 of D1 (as compared to claim 1 of the main request) in terms of the complex shear viscosity $\eta_{0.02}$ according to feature 4) (in addition to the density and the eta/LCBI feature).
- The formulation of the objective problem solved remained the same as the one defined for the main request.

The Board has no reason to deviate from these views.

5.3 Contrary to the decision of the opposition division, the Board, however, arrived at the conclusion that, as put forward by appellant 2, modifying the value of the complex shear viscosity $\eta_{0.02}$ of example 1 of D1 to a

value within the range according to claim 1 was obvious and did not contribute to an inventive step for the following reasons.

5.3.1 In the Board's view, the fact that claim 1 of D1 (see above section 2.3) does not contain any limitation in terms of a range of complex shear viscosity $\eta_{0.02}$ means that the ranges of this feature given in claim 2 of D2 is not more than a preferred embodiment. This view is further confirmed by the passage on page 2, lines 6-11 of D1 in which it is stated that, preferably, in addition to features 1) to 5) specified in claim 1 of D1, the polyethylene composition of the invention of D1 also has a value of complex shear viscosity $\eta_{0.02}$ in the ranges of claim 2 of D1. In addition, the Board could find no passage in D1 explaining why these ranges of complex shear viscosity $\eta_{0.02}$ were actually preferred. In particular, it cannot be derived from D1 that values of complex shear viscosity $\eta_{0.02}$ outside the ranges specified in claim 2 are excluded or would be for any reason detrimental, i.e. D1 does not teach away from values of complex shear viscosity $\eta_{0.02}$ outside the ranges explicitly mentioned in claim 2 thereof. In view of this, polyethylene compositions with a complex shear viscosity $\eta_{0.02}$ higher than 35,000 Pa.s and of e.g. 36,000 Pa.s or slightly higher (i.e. within the range of feature 4) according to claim 1 of auxiliary request 2) are encompassed by the disclosure of D1 as a whole, even if not explicitly mentioned therein.

5.3.2 In addition, as was confirmed by appellant 1 during the oral proceedings before the Board, the skilled person starting from example 1 of D1 would have had no difficulty from a technical point of view to increase the complex shear viscosity $\eta_{0.02}$ so as to be within the range of claim 1 of auxiliary request 2 while

maintaining the other features 1) to 3), 5) and 6) according to claim 1 of auxiliary request 2 in the ranges specified therein.

- 5.3.3 In these circumstances, the Board considers that the skilled person would have had no reason to consider that polyethylene compositions having the combination of features 1) to 6) according to claim 1 of auxiliary request 2, in particular with a value of complex shear viscosity $\eta_{0.02}$ of e.g. 36,000, are excluded from the teaching of D1.
- 5.3.4 During the oral proceedings before the Board, appellant 1 argued that the skilled person would have had no motivation to increase the complex shear viscosity $\eta_{0.02}$ of example 1 of D1 so as to reach a value within the range of claim 1 of auxiliary request 2. According to appellant 1, the skilled person would only have done so with hindsight, which was not allowable.

However, since the objective problem effectively solved resides in the provision of a mere alternative to the polyethylene composition according to example 1 of D1, no incentive in the prior art is needed in order to render the subject-matter claimed obvious. Rather, it is sufficient to show that the (missing) distinguishing feature(s) constitute(s) an arbitrary selection within a host of available alternatives. Indeed, the established decisive principle governing the answer to the question as to what a person skilled in the art would have done depends on the result they wished to obtain (T 939/92: point 2.5.3 of the reasons). In the present case, since the Board considers for the reasons outlined in above points 5.3.1 to 5.3.3 that a polyethylene composition satisfying the combination of

features 1) to 6) according to claim 1 of auxiliary request 2 is within the ambit of the disclosure of D1, the subject-matter of said claim 1 can only be held to be obvious in the light of the disclosure of D1 alone.

- 5.3.5 Therefore, the subject-matter of claim 1 of auxiliary request 2 does not involve an inventive step when example 1 of D1 is taken as the closest prior art and, for that reason, auxiliary request 2 is not allowable.

Auxiliary request 5

6. Claim 1 of auxiliary request 5 differs from claim 1 of the main request in that it was further specified therein that the polyethylene composition being claimed should have a HMWcopo index (as defined therein and in paragraphs 75-76 of the patent in suit) from 0.5 to 3 (see feature 7)).
7. Inventive step in view of example 1 of D1

Distinguishing feature(s)

- 7.1 Appellant 1 indicated that D1 was a document of their own and that they had retrieved from their data that the original measured value of HMWcopo index for the polyethylene composition of example 1 of D1 was 4.13 (statement of grounds of appeal: page 3, ninth and tenth lines and table on page 4, last row; see also the statement made in the last paragraph on page 12 of their letter of 31 July 2025 that said data had already been specified in their rejoinder to the notice of opposition). In view of this information, it was common ground between the parties during the oral proceedings before the Board that, as a consequence of the amendment made in operative claim 1, the subject-matter

now being claimed further differed from the disclosure of example 1 of D1 (as compared to claim 1 of the main request) in that the polyethylene composition being claimed should have a lower value of HMWcopo index.

7.2 Objective Problem and obviousness

7.2.1 During the written proceedings, appellant 1 argued that the amendment made in claim 1 of auxiliary request 5 related to the addition of feature 7) only contributed to an inventive step in that this feature was not disclosed in D1 (letter of 27 March 2024: bottom of page 19). This means that appellant 1 at that stage did not claim that any technical effect was related to feature 7) with the consequence that the objective problem solved remained the one identified for the main request.

During the oral proceedings before the Board, it was not disputed by appellant 1 that values of feature 7) within the prescribed range could be achieved without any difficulty on the basis of the information provided in the patent in suit and common general knowledge. In particular, in reply to a question of the Chairman, appellant 1 indicated that no specific technical measure(s), in particular measures that would not be comprised within the disclosure of the patent in suit or did not belong to common general knowledge, would be necessary in order for the skilled person to arrive at a HMWcopo index from 0.5 to 3. Therefore, in view of the high similarity in terms of disclosure between the patent in suit and D1, the Board considers that, for the same reasons, the skilled person would have had no difficulty, in view of the disclosure of D1 and common general knowledge, to modify example 1 of D1 so as to achieve values of HMWcopo index in the range of 0.5 to

3 while maintaining the other features 1) to 6) of operative claim 1 in the required ranges. In these circumstances, since the range of HMWcopo index according to feature 7) specified in claim 1 of auxiliary request 5 was not shown to be related to any technical effect, selecting a specific value of this feature according to claim 1 of auxiliary request 5 can only constitute an arbitrary measure, which, as such, cannot contribute to an inventive step.

7.2.2 During the oral proceedings before the Board, appellant 1 put forward for the first time that it was self-evident from the definition of the HMWcopo index according to feature 7) itself that was indicated in claim 1 of auxiliary request 5 and from the statements made in paragraphs 75 and 76 of the patent in suit in which said feature was further described, that low(er) values of feature 7) were related to improved processability (low melt viscosity) and shorter cycle times (fast crystallisation). Therefore, according to appellant 1, the skilled person would readily understand that low values of HMWcopo index were eventually related to technical improvements in terms of processability and cycle times that should be taken into account in the formulation of the problem effectively solved.

a) However, the improvements claimed to be achieved by appellant 1 are not supported by any evidence. In particular, no improvement as compared to example 1 of D1 was demonstrated. Therefore, for this reason alone, the argument of appellant 1 cannot convince the Board.

b) In addition, if, to the benefit of appellant 1, it were to be considered that the claimed advantages are self-evident, then, for the same reasons, it would also

be obvious for the skilled person to modify example 1 of D1 so as to achieve these advantages. This is particularly true since, as indicated above, it was acknowledged by appellant 1 that no specific technical measure(s) was/were necessary to achieve values of HMWcopo index in the range of claim 1 of auxiliary request 5 while maintaining the other features 1) to 6) in the required ranges.

c) For these reasons, the arguments of appellant 1 that the addition of feature 7) would result in a different conclusion with respect to the one reached for the main request did not convince.

- 7.2.3 In view of the above, the subject-matter of claim 1 of auxiliary request 5 does not involve an inventive step when example 1 of D1 is taken as the closest prior art and, for that reason, auxiliary request 5 is not allowable.

Auxiliary request 10

8. Inventive step in view of example 1 of D1
- 8.1 Claim 1 of auxiliary request 10 differs from claim 1 of auxiliary request 2 in that it was further specified therein that the polyethylene composition being claimed should comprise two polymer fractions as defined in features A) and B) thereof.

Distinguishing features and objective problem

- 8.2 As pointed out by appellant 2 during the oral proceedings before the Board, it is derivable from the data contained in table 1 together with the indication on page 17, lines 17-18 of D1, that the amendments made

in claim 1 of auxiliary request 10 constitute no additional distinguishing feature(s) over the disclosure of example 1 of D1 (as compared to claim 1 of auxiliary request 2). This was not contested by appellant 1 during the oral proceedings before the Board and the Board sees no reason to deviate from this view.

- 8.3 Therefore, the problem solved over example 1 of D1 remains the same as the one indicated above in respect of auxiliary request 2.

Obviousness

- 8.4 During the written proceedings, appellant 1 did not argue that the amendments made in claim 1 of auxiliary request 10 related to features A) and B) contributed to an inventive step (letter of 27 March 2024: bottom of page 20 to end of page 21). On that basis, claim 1 of auxiliary request 10 does not involve an inventive step over D1 for the same reasons as the ones indicated above for claim 1 of auxiliary request 2.
- 8.5 During the oral proceedings before the Board, appellant 1 argued that the definition of polymer fractions A) and B) and the values of density, complex shear viscosity $\eta_{0.02}$ and eta/LCBI achieved in example 1 of D1 were intrinsically related to one another and could not be dissociated. Therefore, the skilled person would not expect that the definition of fractions A) and B) disclosed in respect of example 1 of D1 would also be relevant for a polyethylene composition that would be modified so as to have a complex shear viscosity $\eta_{0.02}$ in the range specified in claim 1 of auxiliary request 10.

However, in the absence of any evidence or convincing arguments and/or technical reasons put forward by appellant 1 to explain why the definition of fractions A) and B) according to claim 1 of auxiliary request 10 would not be met if the density, complex shear viscosity $\eta_{0.02}$ and eta/LCBI of example 1 of D1 were to be modified so as to be within the respective ranges specified therefor in claim 1 of auxiliary request 10, the aforementioned submissions of appellant 1 are mere allegations and, for that reason, not convincing.

- 8.6 For that reason, the subject-matter of claim 1 of auxiliary request 10 does not involve an inventive step when example 1 of D1 is taken as the closest prior art and auxiliary request 10 is not allowable.
9. Considering that none of the requests defended by appellant 1 is allowable, the patent is to be revoked.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The patent is revoked.

The Registrar:

The Chairman:



D. Hampe

D. Semino

Decision electronically authenticated