

**Internal distribution code:**

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

**Datasheet for the decision  
of 18 October 2024**

**Case Number:** T 0641/23 - 3.3.03  
**Application Number:** 15754164.0  
**Publication Number:** 3183278  
**IPC:** C08F210/18, B32B27/32, H01B3/44  
**Language of the proceedings:** EN

**Title of invention:**

A NEW CROSSLINKED POLYMER COMPOSITION, STRUCTURED LAYER AND  
CABLE

**Patent Proprietor:**

Borealis AG

**Opponent:**

The Dow Chemical Company

**Relevant legal provisions:**

EPC Art. 123(2), 123(3)

**Keyword:**

Amendments - Main request - extension beyond the content of  
the application as filed (yes) - Auxiliary request 1 -  
extension of the protection conferred (yes) - Auxiliary  
requests 2-9 - extension beyond the content of the application  
as filed (yes)

**Decisions cited:**

G 0003/89, G 0011/91, G 0002/10



**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 0641/23 - 3.3.03

**D E C I S I O N**  
**of Technical Board of Appeal 3.3.03**  
**of 18 October 2024**

**Appellant:** Borealis AG  
(Patent Proprietor) Trabrennstrasse 6-8  
1020 Vienna (AT)

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

**Respondent:** The Dow Chemical Company  
(Opponent) 2211 H.H. Dow Way  
Midland MI 48674 (US)

**Representative:** Boulton Wade Tennant LLP  
Salisbury Square House  
8 Salisbury Square  
London EC4Y 8AP (GB)

**Decision under appeal:** **Decision of the Opposition Division of the  
European Patent Office posted on 1 February 2023  
revoking European patent No. 3183278 pursuant to  
Article 101(3)(b) EPC.**

**Composition of the Board:**

**Chairman** D. Semino  
**Members:** D. Marquis  
W. Ungler

## Summary of Facts and Submissions

I. The appeal lies against the decision of the opposition division revoking European patent No. 3 183 278.

II. Claim 1 as granted read:

"1. A crosslinked polymer composition comprising a crosslinked polyolefin, wherein the polymer composition comprises, prior to crosslinking, a polyolefin, and peroxide in an amount of less than 35 mmol -O-O-/kg polymer composition, characterized in that a non-degassed and 1 mm thick plaque sample of the crosslinked polymer composition which has been in a direct contact with a semiconductive composition comprising a polymer and carbon black, for 24h at 70°C, after separation from the semiconductive composition has an electrical DC-conductivity of 150 fS/m or less at 70°C and 30 kV/mm mean electric field, wherein the electrical DC-conductivity is measured in accordance with "DC conductivity method", as described under "Determination methods"; wherein said crosslinked polymer composition comprises less than 0.05 wt% 2,4-Diphenyl-4-methyl-1-pentene.".

III. The decision under appeal was based on the claims of the main request and of auxiliary requests 1-3 filed with the reply to the notice of opposition dated 5 October 2021 and of auxiliary requests 4-9 filed with letter of 18 November 2022.

Claim 1 of the main request corresponded to claim 1 as granted modified in that the composition comprises prior to crosslinking "less than 0.03 wt% 2,4-Diphenyl-4-methyl-1-pentene" and the following

specification is added at the end of the claim:

"wherein said polyolefin is produced in a high pressure process, which process comprises the step of compressing one or more monomer(s) under pressure in a compressor, wherein a compressor lubricant comprising a mineral oil is used for lubrication".

Claim 1 of auxiliary request 1 corresponded to claim 1 of the main request with the deletion of the wording "comprises a polymer and carbon black" with reference to the semiconductive composition used in the measurement method.

Claim 1 of auxiliary request 2 corresponded to claim 1 of the main request modified in that the composition comprises prior to crosslinking "no 2,4-Diphenyl-4-methyl-1-pentene".

Claim 1 of auxiliary request 3 corresponded to claim 1 of the main request in which it is specified that said polyolefin "is a low density polyethylene (LDPE) which is selected from an optionally unsaturated LDPE homopolymer or an optionally unsaturated LDPE copolymer of ethylene with one or more comonomer(s)".

Claim 1 of auxiliary request 4 concerned "A layered structure which comprises a polymer layer and at least one semiconductive layer adjacent to said polymer layer, which polymer layer comprises a crosslinked polymer composition" whereby the crosslinked polymer composition corresponded to that defined in claim 1 of auxiliary request 2 "wherein said polyolefin is a low density polyethylene (LDPE) which is selected from an optionally unsaturated LDPE homopolymer or an optionally unsaturated LDPE copolymer of ethylene with one or more comonomer(s)".

Claim 1 of auxiliary request 5 read:

"1. A process for producing a cable comprising the steps, in any order, of

- exposing a polymer layer composition comprising a polyolefin, a peroxide in an amount of less than 35 mmol -O-O-/kg polymer composition and less than 0.03 wt% 2,4-Diphenyl-4-methyl-1-pentene; to a curing procedure during which the maximum temperature of the polymer layer composition is, for example, above 150°C, e.g. 160 to 350°C, whereby the polymer layer composition is crosslinked;

wherein said polyolefin is produced in a high pressure process, which process comprises the step of compressing one or more monomer(s) under pressure in a compressor, wherein a compressor lubricant comprising a mineral oil is used for lubrication; and

- providing at least one semiconductive layer adjacent to said polymer layer;

wherein a non-degassed and 1 mm thick plaque sample of the crosslinked polymer composition which has been in a direct contact with a semiconductive composition comprising a polymer and carbon black, for 24h at 70°C, after separation from the semiconductive composition has an electrical DC-conductivity of 150 fS/m or less at 70°C and 30 kV/mm mean electric field, wherein the electrical DC-conductivity is measured in accordance with "DC conductivity method", as described under "Determination methods".

Claim 1 of auxiliary request 6 corresponded to claim 1 of the main request in which it is specified that said polyolefin "is an unsaturated LDPE copolymer of ethylene with at least one polyunsaturated comonomer and optionally with one or more other comonomer(s)".

Claim 1 of auxiliary request 7 corresponded to claim 1 of auxiliary request 6 modified in that the composition comprises prior to crosslinking "no 2,4-Diphenyl-4-methyl-1-pentene".

Claim 1 of auxiliary request 8 corresponded to claim 1 of auxiliary request 4.

Claim 1 of auxiliary request 9 corresponded to claim 1 of auxiliary request 5 modified in that the polymer layer composition comprises "no 2,4-Diphenyl-4-methyl-1-pentene" and it is specified that said polyolefin "is an unsaturated LDPE copolymer of ethylene with at least one polyunsaturated comonomer and optionally with one or more other comonomer(s)".

IV. The following documents were *inter alia* submitted during the opposition proceedings:

D8: WO 2011/057925 A1

D13: WO 2011/057927 A1

D18: Product Datasheet Polyethylene Borlink™ LE0550DC

V. The decision under appeal, as far as it is relevant to the present appeal, can be summarized as follows:

- claim 1 of the main request did not fulfil the requirements of Article 123(2) EPC;
- claim 1 of auxiliary request 1 did not fulfil the requirements of Articles 123(3) and 84 EPC;
- claim 1 of auxiliary request 2-9 did not fulfil the requirements of Article 123(2) EPC.

VI. The patent proprietor lodged an appeal against the decision of the opposition division and filed with the

statement of grounds of appeal a main request and auxiliary requests 1 to 9.

VII. Oral proceedings before the Board were held on 18 October 2024.

VIII. The final requests of the parties were as follows:

- The appellant requested that the decision under appeal be set aside and that the case be remitted to the opposition division for further prosecution on the basis of the main request or any of the auxiliary requests 1-9, all filed with the statement of grounds of appeal.
- The respondent requested that the appeal be dismissed or, should the decision under appeal be set aside, that the case be remitted to the opposition division for further prosecution.

The main request and auxiliary requests 1 to 9 corresponded respectively to the main request and auxiliary requests 1 to 9 upon which the decision under appeal was based.

IX. The parties' submissions, in so far as they are pertinent, may be derived from the reasons for the decision below. The disputed points concerned the fulfilment of the requirements of Article 123(2) EPC for claim 1 of the main request and of auxiliary requests 2 to 9 and the fulfilment of the requirements of Article 123(3) EPC for claim 1 of auxiliary request 1.



## **Reasons for the Decision**

Main request

1. Article 123(2) EPC

1.1 The opposition division concluded in their decision that there was no basis in the application as originally filed for the definition of the semiconductive composition used in the measurement of the electrical DC-conductivity of the crosslinked composition as comprising "a polymer and carbon black" (decision under appeal, page 5). The appellant contended in appeal that the amendment in claim 1 of the main request did not infringe the requirements of Article 123(2) EPC.

1.2 According to Article 123(2) EPC the European patent application or the European patent may not be amended in such a way that it contains subject-matter which extends beyond the content of the application as filed. According to the "gold standard" (G 2/10, OJ 2012, 376) for assessing compliance with Article 123(2) EPC any amendment to the parts of a European patent application or of a European patent relating to the disclosure (the description, claims and drawings) is subject to the mandatory prohibition on extension laid down in Article 123(2) EPC and can therefore, irrespective of the context of the amendment made, only be made within the limits of what a skilled person would derive directly and unambiguously, using common general knowledge, and seen objectively and relative to the date of filing, from the whole of these documents as filed (G 3/89, OJ 1993, 117; G 11/91, OJ 1993, 125).

After the amendment the skilled person may not be presented with new technical information (G 2/10).

- 1.3 The amendment in dispute concerns the presence of a combination of a polymer and carbon black in a semiconductive composition that is brought into contact with a plaque sample of the crosslinked polymer composition prior to the measurement of its electrical DC-conductivity. While the semiconductive composition disclosed in operative claim 1 is not as such a component of the crosslinked polymer composition, it is nevertheless an essential part of its characterization since it is a component used in the preparation step of a sample on which the electrical DC-conductivity is measured. It is also apparent from the passage on page 5, lines 8-23, that the electrical DC-conductivity of the crosslinked polymer composition has in fact changed after having been contacted with a semiconductive composition. That is confirmed by the examples of the patent in suit which show that the electric conductivity of a plaque of a crosslinked polymer compositions has changed significantly after contact with a semiconductive layer at 70°C for 24 hours (see in particular the data at the bottom of Table 1). The semiconductive composition used during the determination of the electrical DC-conductivity according to operative claim 1 therefore has an impact on the measured property which defines the crosslinked polymer composition. In view of this, the components of the semiconductive composition, including the polymer and carbon black, brought into contact with the crosslinked polymer composition are also part of the definition of crosslinked polymer composition of operative claim 1 even if they are not constitutive components of that composition.

- 1.4 Claim 1 as originally filed defines the same steps leading to the measurement of the electrical DC-conductivity as claim 1 of the main request, but the semiconductive composition used in the measurements is not further defined. The critical question is therefore whether the application as originally filed contains a basis for the definition of the semiconductive composition as one comprising a polymer and carbon black.
- 1.5 The semiconductive composition used in the determination of the electrical DC-conductivity of the crosslinked polymer composition is mentioned in the passage relating to the DC conductivity method on pages 28-29 of the application as originally filed. The paragraph on page 28, lines 16-21 describes that the DC conductivity method involves the preparation of plaques by compression moulding pellets of a semiconductive polymer composition.
- 1.6 The passage bridging pages 28 and 29 further mentions the role of the semiconductive polymer compositions in the determination of the electrical DC-conductivity of the polymer compositions to be tested. In a step referred to as the conditioning step, one plaque, consisting of the crosslinked polymer composition to be tested, and one plaque, consisting of the semiconductive polymer composition, were stored together in direct contact with each other in a closed aluminium bag at 70°C for 24 hours. After the conditioning step the plaques were separated and DC conductivity measurement was performed on the plaque, consisting of the crosslinked polymer composition to be tested. The method for the measurement of the DC-conductivity disclosed in the description of the application as originally filed corresponds to that

defined in claim 1 of the main request but apart from lines 16-17, 24 and 33 on page 28 mentioning the use of a semiconductive **polymer** composition (emphasis added), there is no further disclosure of the material of the composition and in particular no mention of carbon black being present in the semiconductive composition.

1.7 Carbon black in combination with a polymer as part of a semiconductive composition is disclosed solely on page 21, lines 15-21 of the application as originally filed. That passage, however, belongs to the chapter "End uses and end applications of the invention" starting on page 19, line 8 which concerns the use of crosslinked polymer compositions and semiconductive compositions for the production of power cables. It is therefore apparent that the references to semiconductive compositions in that passage only pertain to outer and inner layers of the power cables and not to the semiconductive compositions used in the DC-conductivity method described on page 28 of the application as originally filed.

1.8 In that respect the appellant argued that the skilled reader of the application as originally filed would have understood that the passage disclosing semiconductive compositions comprising carbon black for power cables on pages 20-22 and the passage on the DC-conductivity method on pages 28-29 referred to the same semiconductive composition (statement of grounds of appeal, section 18). This would be due to the fact that the test conditions are meant to mimic the semiconductive layers of a cable in use. The Board, however, does not find support for that relationship in the application as originally filed. In this respect, the passage on page 8, lines 21-30 of the application as originally filed which mentions layered structures

comprising a polymer layer and at least one semiconductive layer adjacent to the polymer layer uses the indefinite article "a" when it discloses the semiconductive composition contacted with the polymer composition for 24h at 70°C, indicating that that semiconductive composition is not necessarily defined by the semiconductive composition of the layer. In addition the semiconductive composition comprising carbon black is mentioned on pages 20-22 as just one example of a possible composition for the layers and not as the one which is necessarily selected for use. Therefore, even if the skilled person considered the measurement as meant to mimic the situation in use, no link to the necessary use of carbon black in the measurement would be present.

- 1.9 The appellant additionally considered that the examples of the application as originally filed supported the presence of carbon black in the semiconductive composition used in the DC-conductivity method (statement of grounds of appeal, section 20). It was in particular argued that the examples of the application as originally filed disclosed the use of a commercially available semiconductive polymer composition based on a commercially available product (LE0550) (page 32, line 6 of the application as originally filed). That commercially available product LE0550 would comprise, alongside a polymer, carbon black, as shown in D8 (page 56, line 24), D13 (page 49, line 2) and D18 (paragraph "special features"). The disclosure of the examples, however, is specific to the compositions disclosed therein. There is, beyond that example, no generalizable teaching in the application as originally filed from which it could be concluded that the semiconductive compositions used in the characterization of the crosslinked polymer

compositions according to operative claim 1 contained a polymer and carbon black in general.

1.10 The appellant further argued that the presence of a polymer and carbon black in semiconductive compositions was part of the common general knowledge of the skilled person. The Board, however, does not find support for that argument in the evidence discussed in appeal.

1.11 The Board therefore comes to the conclusion that claim 1 of the main request does not meet the requirements of Article 123(2) EPC.

Auxiliary request 1

2. Article 123(3) EPC

2.1 Claim 1 of auxiliary request 1 concerns a crosslinked polymer composition as disclosed in claim 1 of the main request but does not define the semiconductive composition used in the measurement method as comprising a polymer and carbon black.

2.2 Granted claim 1 defines a crosslinked polymer composition in which the semiconductive composition used in the measurement method contains a polymer and carbon black. The opposition division concluded that claim 1 of auxiliary request 1 did not meet the requirements of Article 123(3) EPC in view of that deletion (section 6 of the decision under appeal).

2.3 The appellant argued in appeal that the amendment made in claim 1 of auxiliary request 1 does not extend the protection conferred by the patent in suit (section 40 of the statement of grounds of appeal). It is apparent from section 41 of the statement of grounds of appeal

that the argument of the appellant relied on the premise that the semiconductive composition was not part of the crosslinked polymer composition defined in claim 1 but instead was part of the definition of the measurement of a parameter of that composition. As set out above under point 1.3, the semiconductive composition is disclosed as having an effect, by contact for 24h at 70°C prior to measurement, on the electrical DC-conductivity of the crosslinked polymer composition. In view of this, the components of the semiconductive composition also have an impact on the measurement made, especially if these components are expected to participate in the properties of the semiconductive composition itself. Deleting the compulsory presence of a polymer and carbon black in claim 1 of auxiliary request 1 therefore extends the scope of the claim beyond the extent of protection of granted claim 1. In this respect, the Board finds that a reading of claim 1 of auxiliary request 1 as implying that the condition on the electrical DC-conductivity should be met for any semiconductive composition (including one comprising a polymer and carbon black) is not in agreement with the wording of claim 1, nor appears to be technically and practically reasonable. For these reasons, the Board comes to the conclusion that claim 1 of auxiliary request 1 does not meet the requirements of Article 123(3) EPC.

#### Auxiliary requests 2-9

#### 3. Article 123(2) EPC

3.1 It is apparent that claim 1 according to auxiliary requests 2-9 contains the same amendment as claim 1 of the main request that was found by the Board to infringe on Article 123(2) EPC. In this respect, it was

acknowledged by the appellant that, if the Board came to the conclusion that that amendment was not allowable under Article 123(2) EPC for the main request, then the same conclusion would also apply to claim 1 of auxiliary requests 2-9. For this reasons the Board comes to the conclusion that claim 1 of auxiliary requests 2-9 does not meet the requirements of Article 123(2) EPC.

## Order

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

The appeal is dismissed.

The Registrar:

The Chairman:



D. Hampe

D. Semino

Decision electronically authenticated