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**Datasheet for the decision
of 8 October 2025**

Case Number: T 1687/23 - 3.3.03

Application Number: 15721152.5

Publication Number: 3134474

IPC: C08L55/02, C08L25/12,
C08L69/00, C23C18/16

Language of the proceedings: EN

Title of invention:
POLYMER BLEND FOR METAL PLATING

Patent Proprietor:
INEOS Styrolution Group GmbH

Opponent:
Elix Polymers, S.L.

Relevant legal provisions:
RPBA 2020 Art. 12(2), 12(4), 13(1)
EPC Art. 54, 56

Keyword:
Amendment to case - amendment admitted (yes)
Novelty - (yes)
Inventive step - (yes)

Decisions cited:

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 1687/23 - 3.3.03

D E C I S I O N
of Technical Board of Appeal 3.3.03
of 8 October 2025

Appellant:

(Opponent)

Elix Polymers, S.L.
Poligono Industrial
Ctra. de Vilaseca
La Pineda s/n
43110 La Canonja (ES)

Representative:

ABG Intellectual Property Law, S.L.
Avenida de Burgos, 16D
Edificio Euromor
28036 Madrid (ES)

Respondent:

(Patent Proprietor)

INEOS Styrolution Group GmbH
Mainzer Landstraße 50
60325 Frankfurt am Main (DE)

Representative:

Jacobi, Markus Alexander
Patentanwälte
Isenbruck Bösl Hörschler PartG mbB
Eastsite One
Seckenheimer Landstraße 4
68163 Mannheim (DE)

Decision under appeal:

**Interlocutory decision of the Opposition
Division of the European Patent Office posted on
27 July 2023 concerning maintenance of the
European Patent No. 3134474 in amended form.**

Composition of the Board:

Chairman D. Semino
Members: D. Marquis
 M. Millet
 O. Dury
 W. Ungler

Summary of Facts and Submissions

I. The appeal lies against the decision of the opposition division concerning maintenance of European patent No. 3 134 474 in amended form on the basis of the claims of the main request filed with letter of 16 October 2020 and a description adapted thereto.

II. The decision under appeal was based on that request whose claim 1 read as follows:

"1. Thermoplastic molding composition comprising components A) to C):

A) 30 to 40 wt.% of at least one graft rubber copolymer (A) obtained by emulsion polymerization of styrene and acrylonitrile in a weight ratio of 95:5 to 50:50, styrene and/or acrylonitrile being able to be partially or completely replaced by [alpha]-methylstyrene, methyl methacrylate or N-phenylmaleimide or mixtures thereof, in the presence of at least one polymer latex (a) of a conjugated diene;

B) 30 to 40 wt.% of at least one rubber free vinyl copolymer of 50 to 99 percent (B1) and 1 to 50 percent (B2), the percent being relative to the weight of the copolymer, where (B1) is at least one member selected from the group consisting of styrene, α -methyl styrene, nucleus-substituted styrene, and methyl methacrylate and where (B2) is at least one member selected from the group consisting of acrylonitrile, methyl methacrylate, maleic anhydride, N-alkyl-substituted maleic imide and N-aryl-substituted maleic imide; and

C) 25 to 34 wt.-% by weight of at least one aromatic

polycarbonate;

wherein the sum of components A), B) and C) totals 100% by weight, and wherein the thermoplastic molding composition comprises as component A two or more graft rubber polymers (A1), (A2), (A3) etc. which are different in the mean particle diameter d_{50} of the polymer latex (a) of the conjugated diene".

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

- D3 : Certificate of Analysis of batch 212220023A of ELIX Ultra 4105
- D4 : Delivery note 3006574551 for batch 212220023A of ELIX Ultra 4105
- D5 : Invoice 8200014826 for batch 212220023A of ELIX Ultra 4105 dated 14 January 2013
- D6 : Payment of invoice 8200014826
- D10 : WO 2013/100336 A1
- D11 : Chrisochoou et al., Styrenic Copolymers, Rapra Technology, 2002, pages 1, 11-22 and 43
- D12 : US 2013/0203909 A1
- D13 : US 2013/0158183 A1
- D14 : US 2003/0036586 A1
- D15 : US 4,212,774
- D16 : B.D. Gesner, Phase Separation of Some Acrylonitrile-Butadien-Styrene Resins, J. Pol. Sci. Part A, 1965, 3, pages 3825-3831
- D25 : B. Ellis, R. Smith, Eds., Polymers: A property Database, Second Edition, CRC Press, 2008, excerpt of page 27
- D26 : R.C. Rowe, P.J. Sheskey, P. J. Weller, Handbook of Pharmaceutical Excipients, Fourth Edition, Pharmaceutical Press, 2003, excerpt of page 484

- D27: Declaration of Dr. Ramon Malet Murillo from 4 March 2021
- D28: Kampf et al., Struktur und Eigenschaften von ABS-Polymeren. IX Quantitative Untersuchungen zur Morphologie von ABS-Polymerisaten, Ang. Makromol. Chem., 1972, 27(409), pages 81-98
- D29: Adams et al., Acrylonitrile-Butadiene-Styrene Polymers, Rapra Review Reports, 1993, 6(10), pages 1, 2, 8 and 9 (Report 70)
- D30: Standard ISO 6603-2

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

- Documents D25-D30 were admitted into the proceedings.
- The product ELIX Ultra 4105 had been available to the public before the priority date of the patent in suit, but it had not been shown that its composition could have been determined by chemical analysis and that the skilled person could have manufactured it at that point in time.
- The claims of the main request were inventive over D10 or D12 taken alternatively as the closest prior art.

V. The opponent (appellant) lodged an appeal against the decision of the opposition division.

VI. The appellant filed D31-D35 with their statement of grounds of appeal and D37 with their letter of 4 December 2024:

- D31: Report N°: PR23017 Characterization of the physical-chemical composition of an ABS-PC sample, pages 1-22

- D32: C.B. Bucknall, TOUGHENED PLASTICS, Springer Science+Business Media, B.V., 1977, Vol. 1, pages 102-104
- D33: H.F. Mark, Encyclopedia of Polymer Science and Technology, third Edition, 7 February 2003, pages 174-203
- D34: S.L. Sun, X.Y. Xu, Z.Y. Tan, C. Zhou, Y.H. Ao, M.Y. Zhang, H.X. Zhang, Structure-Properties Relationship in Toughening of Poly(butylene terephthalate) with Core-Shell Modifier, Journal of Applied Polymer Science, Vol. 102, pages 5363-5371 (2006)
- D35: R. Kuhn, H.G. Müller, G. Bayer et al. Characterization of bimodal bigraft ABS, Colloid and Polymer Science, 271, pages 133-142 (1993)
- D37: Test Report - RE102830: Ethylbenzene content by TD-GC-MS, 9 September 2024

VII. The patent proprietor (respondent) filed D38 and D39 with their letter of 3 March 2025:

- D38: V.G. Kämp and H. Schuster, Struktur und Eigenschaften von ABS-Polymeren. IV. Teilchengrößenbestimmungen an Butadien-Homo- und Pfropfpolymerisat-Latices mit dem Elektronenmikroskop, Angew. Makromol. Chem., 14: pages 111-129 (1970)
- D39: ASTM D2827-08, Standard Specification for Styrene Monomer

VIII. Oral proceedings before the Board were held on 8 October 2025.

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

The appellant requested that the decision under appeal

be set aside and that the European patent No. 3 134 474 be revoked.

The respondent requested that the appeal be dismissed, or in the alternative, that the patent be maintained in amended form on the basis of the claims of one of auxiliary requests 1, 2, 3a, 3, if 3a is not admitted, and 4, auxiliary requests 1 to 4 as submitted with the rejoinder to the statement of grounds of appeal and auxiliary request 3a as filed with letter of 8 July 2025.

- X. 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 admittance of documents D25-D30, D31-D35 and D37-D39 into the proceedings, the novelty of claim 1 of the main request over the alleged public prior use ELIX ABS 4105 or E.4105 and inventive step in view of D10 or D12 as documents representing the closest prior art.

Reasons for the Decision

1. Admittance of documents
 - 1.1 D25-D30 were submitted with letter of 8 March 2021 in opposition and were admitted into the proceedings at the oral proceedings on the ground that they were *prima facie* relevant to the question of novelty over the alleged public prior use of the commercial product ELIX Ultra 4105 (decision under appeal, section 19). D25-D30 were filed 5 months after the patent proprietor filed a new main request (16 October 2020) and in support of an objection that was fully formed with the notice of opposition (page 8, section 5.1). Contrary to the argument laid out by the respondent (rejoinder, page 4,

last two full paragraphs from the bottom), the Board does not find any element that would support a deliberate withholding of documents from the side of the opponent (the declaration D27 was signed on 4 March 2021 a few days before it was filed) and showing an abuse of proceedings.

1.1.1 The Board finds that, given their filing after the opposition period, the admittance of D25-D30 was at the discretion of the opposition division. The opposition division considered, under the relevant circumstances, that D25-D30 were *prima facie* relevant for the assessment of the question of novelty, which is the appropriate criterion in the situation (Case Law of the Boards of Appeal, 11th edition 2025, IV.C.4.5.3). There is further no legal basis in the EPC or in the Rules of Procedure of the Boards of Appeal for retroactively excluding evidence that was admitted into the proceedings, particularly if the appealed decision is based on them. In view of the very aim of the appeal proceedings to review the decision under appeal in a judicial manner according to Article 12(2) RPBA, such submissions are automatically part of the appeal proceedings (cf. Article 12(2) RPBA and Case Law, *supra*, V.A.3.4.3). On that basis, the Board concludes that documents D25-D30 are in the proceedings.

1.2 D31-D35 are documents concerning the alleged public prior use of ELIX Ultra 4105 which were filed with the statement of grounds of appeal (section 2). D31 is an analytical report and D32-D35 are academic publications cited in the discussion of that report. The analytical report is said to concern the composition of ELIX Ultra 4105, its analysis by standard analytical methods and reproducibility by the skilled person before the date

of priority of the patent in suit.

- 1.2.1 D31 was said to be submitted in reaction to the decision of the opposition division in which it was considered that the composition of the product ELIX Ultra 4105 could not have been determined by standard analytical methods (statement of grounds of appeal, page 2, third paragraph). The admittance of D31 into the appeal proceedings was contested by the respondent on the grounds that D31 and the accompanying documents D32-D35 could and should have been filed earlier during the opposition proceedings (rejoinder, pages 6 and 7).
- 1.2.2 The objection concerning the alleged public prior use of ELIX ULTRA 4105 was laid out in the notice of opposition (section 5.1). The notice of opposition discusses the date of the alleged public prior use, the identification of the composition allegedly disclosed and the circumstances of the alleged public prior use (page 9). The analysis of the product ELIX ULTRA 4105 using methods (modification, separation and IR analysis) known at the priority date of the patent in suit was also discussed in the notice of opposition (pages 11-13).
- 1.2.3 It is apparent from the written opposition proceedings that doubts relating to the quantitative analysis of the composition of ELIX ULTRA 4105 by the methods disclosed in D15 and D16 were first raised by the patent proprietor with their letter of 20 December 2022 (pages 5 and 6, item e), four months before the oral proceedings before the opposition division. These doubts were found to be particularly relevant since the alleged public prior use of ELIX ULTRA 4105 was rejected in the decision under appeal among others because it had not been established that the amounts of

polycarbonate, ABS and SAN polymers in ELIX ULTRA 4105 could be determined using the analytical methods mentioned by the opponent (decision under appeal, sections 20.4.1-20.4.3).

1.2.4 D31 and its accompanying documents D32-D35 address the question of the quantitative analytical determination of the composition of the alleged public prior use of ELIX ULTRA 4105 and as such it can be accepted that D31-D35 were filed in reaction to a reasoning of the opposition division first made available with their written decision. Even though the point dealt with in the decision had formally been raised in writing by the patent proprietor during the opposition procedure, it can be accepted that the opponent was not in the position to address it exhaustively since it was only made four months before the oral proceedings and the opposition division could not issue a preliminary opinion on that point. In view of this, the Board finds it appropriate to exercise its discretion by admitting D31-D35 into the appeal proceedings (Article 12(4) RPBA).

1.3 D37 was filed by the appellant with letter of 4 December 2024, i.e. after the statement of grounds of appeal. D37 contains results of the determination of the volatile organic components (VOC) and in particular ethylbenzene in a sample of ELIX ULTRA 4105. It is apparent from section 5.1.3 of D31 that the content in ethylbenzene of the sample analysed in that document could not be determined due to technical difficulties. The content of ethylbenzene determined in D37 allegedly confirms that the ABS polymer of the sample was obtained by emulsion polymerization (letter of the appellant dated 4 December 2024, page 8, sixth paragraph). Since that argument was already present in

the statement of grounds of appeal (page 17, second paragraph) and D37 is used to confirm a conclusion reached independently from the morphological analysis of the sample (section 5.1.1 of D31), the Board finds it appropriate to exercise its discretion by admitting also D37 into the proceedings (Article 13(1) RPBA).

1.4 D38 and D39 were provided by the respondent with their letter of 3 March 2025, i.e. after the rejoinder had been filed.

1.4.1 D38 was submitted in reaction to an argument of the appellant put forward in their letter of 4 December 2024 (page 4, fifth paragraph) concerning the morphology of polybutadiene particles. The filing of D38 is therefore a legitimate reaction to a development in the proceedings. In view of this, the Board finds it appropriate to exercise its discretion by admitting D38 into the proceedings (Article 13(1) RPBA).

1.4.2 D39 is ASTM 2827 (2008) setting up a standard defining styrene and its impurities for industrial applications which was said to be filed in reaction to D37 (letter of 3 March 2025, page 2). In the absence of counterarguments the Board finds it appropriate to exercise its discretion by admitting also D39 into the proceedings (Article 13(1) RPBA).

Main request

2. Prior use ELIX ABS 4105 or E.4105

2.1 The opposition division concluded that D3-D6 showed that a product ELIX Ultra 4105 had been made available to the public before the priority date of the patent in suit but that it had not been established that its

composition could be determined by chemical analysis and that the product could be reproduced by a skilled person (decision under appeal, sections 20.1-20.5).

- 2.2 D3-D6 in particular establish the sale of 475 kg of a batch (212220023A) of a product referred to as E.4105 or ELIX ABS4105 from Elix Polymers S.L. to Quimidroga S.A. with a delivery date of 15 January 2013, which is before the priority date of the patent in suit (25 April 2014). D3-D6 refer to compounds named E.4105 and ELIX ABS 4105 but it is clear from the whole of the documents and in particular from D4 that E.4105 and ELIX ABS 4105 concern one and the same product and that that product was the object of the sale.
- 2.3 The next question with respect to that sale was to establish what that product was and whether it was according to claim 1 of the main request.
- 2.4 To establish what the composition of E.4105 was at the date of the sale shown in D3-D6 and confute the conclusion of the opposition division, the appellant relied on an analytical report D31 referring also to documents D32-D35 newly submitted in appeal (statement of grounds of appeal, pages 8 to 17). The appellant thereby contested the conclusion reached in the decision under appeal on the question of the quantitative determination of the graft rubber copolymer component A) also referred to as acrylonitrile butadiene styrene (ABS), rubber free vinyl copolymer component B) also referred to as styrene acrylonitrile (SAN) and the polycarbonate (PC) component C), that were acknowledged to be present in the commercially available product E.4105.

- 2.5 D31 is an experimental report dated 23 November 2023 performed in the laboratories of the technological centre POLYMAT. The report contains analytical tests carried out on an industrial sample of "ELIX ULTRA ABS 4105 000000" from a batch having the reference number 223060018/A (section 3). The name used in D31 (ELIX ULTRA ABS 4105 000000) differs only slightly from that used in D3-D6 (E.4105 or ELIX ABS 4105) and it is apparent from the minutes of the taking of evidence of Mr Malet Murillo conducted during the oral proceedings before the opposition division that these names were all referring to the same commercially available product (page 13).
- 2.6 Section 4.2 of D31 shows the principles of how the fractionation of the sample was carried out in D31. The fractions obtained are identified in its Figure 1. Even if one can derive from that figure that the fractionation scheme followed in D31 differs to some extent from that disclosed in Figure 1 of D16, it can be accepted that D16 established the most relevant principles of the fractionation method that were applied to the fractionation in D31. It is also reasonable to assume that the skilled person, in any given situation in which a fractionation of an ABS resin must be carried out, would have to consider and adapt known methods and schemes of ABS fractionation such as that of D16 to the specific composition they are faced with. In this respect, even if changes can be found in the fractionation scheme according to D31 as argued by the respondent (rejoinder, pages 20 and 21), the Board does not see how this could show that the skilled person would not have been able to set up the scheme followed in D31, which only includes well-known fractionation steps, before the priority date of the

patent in suit.

2.7 Section 5.2 of D31 indicates that common analytical methods (NMR, IR, chromatography) were known and were used to characterize the five fractions (1.A, 2.A, 2.B, 3.A and 3.B) whose respective compositions are reported in Table 1 on page 8 of D31. Considering common general knowledge on the graft efficiency during the preparation of ABS by emulsion polymerization (D31, page 8) and the details of the fractions of Table 1, an estimated composition of the sample analysed in D31 is disclosed in Table 2 on page 9 of that document:

Polymer	Weight%
ABS	29.7-38.2
SAN	30.8-39.4
PC	30.9

2.8 The data provided in Table 2 of D31 are said to be calculated relying on the teaching of D34 with respect to the grafting efficiency during the preparation of ABS by emulsion polymerization being 70-90% (considered in the last paragraph of page 8 in D31). The discussion in section 5.2 of D31 however does not explain why the teaching of D34 was considered to be applicable to the present situation. In this respect, the respondent argued that D34 would not be relevant as the teaching of D34 on grafting efficiency would be confined to the specific reaction conditions during polymerization used in that document (rejoinder, page 23, third paragraph). Indeed, it was not made plausible to the Board in how far the teaching of D34 could be applied to the analysis carried out in D31 especially since little could be derived from D31 as to the preparation of the product contained in the sample. In particular, D34

shows that the chain transfer agent tert-dodecyl mercaptan (TDDM) (page 5364), its amount during the polymerization as well as the initiator have an impact on the grafting efficiency (pages 5370-5371, Conclusion). It is however not known if these components were used during the preparation of the product analysed in D31 and the one sold in D3-D6. In the absence of a justification that D34 could effectively be applied to D31, it was doubtful whether the composition provided in Table 2 of D31 effectively corresponded to that of the sample analysed therein.

2.9 In this respect, the respondent argued that they could not verify the ranges defining the amounts of ABS, SAN and PC disclosed in Table 2 in D31 based on the information contained in that document. Indeed, based on the data in Table 1, the respondent calculated amounts of components that differed significantly from those disclosed in Table 2 of D31 and were not according to operative claim 1 (rejoinder, pages 22 and 23):

Component	Weight %
ABS graft copolymer	25.8
SAN copolymer	42.0
Polycarbonate	30.9
Polybutadiene	0.8
Additives	0.5

2.10 The Board addressed that discrepancy in the calculation of the amounts of the components of the composition in their preliminary opinion and indicated that a clarification and explanation for these results of D31 would be needed from the side of the appellant (section 7.18), if they intended to rely on the data in Table 2

of D31. The appellant did not address that point in writing any further and did not wish to provide further comments in that respect at the oral proceedings before the Board. In view of this, the Board does not see how it could be concluded that D31 discloses a composition with ABS and SAN components in amounts according to components A) and B), respectively, according to operative claim 1.

2.11 In view of the uncertainties as to the calculations of the amounts of the components of the thermoplastic molding composition in D31, the Board concludes that it has not been shown that the alleged public prior use ELIX ABS 4105 or E.4105 takes away the novelty of claim 1 of the main request.

3. Inventive step

3.1 The decision under appeal concluded that the claims of the main request were inventive over D10 and D12 as documents alternatively representing the closest prior art. The objections of lack of inventive step in view of D10 and D12 were pursued in appeal (statement of grounds of appeal, sections 6 and 7).

3.2 D10 as the closest prior art

3.2.1 Example 6 of D10 was discussed by both parties as the most relevant starting point within that document (statement of grounds of appeal, page 19, section 6.4; rejoinder, page 36, last paragraph), which is also found reasonable by the Board. The opposition division concluded (decision under appeal, section 21.3) that claim 1 of the main request differed from example 6 of D10 in

- (i) the use of two or more graft rubber polymers which are different in particle diameter d_{50} of the polymer latex (a) of the conjugated diene, and
- (ii) the use of different amounts of polycarbonate, rubber free copolymer (e.g. SAN) and graft rubber copolymer.

3.2.2 Both parties in appeal acknowledged the distinguishing features (i) and (ii) over example 6 of D10 (statement of grounds of appeal, section 6.4; rejoinder, page 38, first paragraph). In this respect, the Board has no reason to take a different position.

3.2.3 The respondent, however, considered that example 6 of D10 did not explicitly disclose an aromatic polycarbonate and saw that as a further distinguishing feature of operative claim 1. The Board addressed that argument in their communication (sections 8.2.3-8.2.6) and gave the preliminary opinion that it could not be concluded that the polycarbonates used in example 6 of D10 specifically were indeed aromatic. The question of whether the use of aromatic polycarbonates defined in operative claim 1 constitutes a further difference over example 6 of D10 or not can however be left aside as the Board already comes to the conclusion that the subject matter of operative claim 1 involves an inventive step over D10 on the basis of the differences (i) and (ii) which were undisputed in appeal.

3.2.4 The opposition division concluded that the patent in suit did not establish the presence of an effect resulting from the distinguishing features over D10 (decision under appeal, section 21.4). The problem was therefore formulated as the provision of an alternative

ABS-SAN-Polycarbonate composition (decision under appeal, section 21.5). The respondent contested that conclusion and argued that the patent in suit established the presence of improved properties of the composition (rejoinder, page 38).

- 3.2.5 As to any effect relied upon, it is established case law of the Boards that an unexpected effect demonstrated in a comparative test can be taken as an indication of inventive step on condition 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 or combination of distinguishing features of the invention as compared with the closest state of the art (Case Law, *supra*, I.D.4.3.2).
- 3.2.6 The respondent argued that the comparison of example 1 with the non-inventive example 2 showed that the combination of amounts in polycarbonate (C) and SAN polymer (B) improved the mechanical properties of the composition (rejoinder, page 40, last paragraph). Example 1 (30 wt.-% PC and 35 wt.-% SAN) represented claim 1 of the main request (25-34 wt.-% PC and 30-40 wt.-% SAN) and differed from the composition of non-inventive example 2 (45 wt.-% PC and 20 wt.-% SAN) only in the amounts of PC and SAN polymers (the amount in ABS in these two examples being 35 wt.-% and in the range of claim 1 of the main request). The composition of non-inventive example 2 was therefore considered by the respondent as representative of the composition of the closest prior art example 6 of D10 and its comparison with example 1 was valid. The appellant contested the relevance of that comparison on the grounds that non-inventive Example 2 differed from the closest prior art (Example 6 of D10) in multiple

aspects (other than the amounts of PC and SAN) and as such that example could not be seen as being representative of example 6 of D10 (letter of 17 March 2025, page 2, item 7).

3.2.7 Non-inventive example 2 of the patent in suit, as shown by the appellant, indeed differs from example 6 of D10 not only in the amounts of polycarbonate and SAN polymers, but also in that

- (i) one polycarbonate polymer (patent in suit, paragraph 101) was used instead of two (polycarbonates (A-1) and (A-2) in Table 1 of D10),
- (ii) one SAN polymer (patent in suit, paragraph 110) was used instead of two (SAN polymers (C-2) and (C-4) in Table 1 of D10), and
- (iii) two ABS polymers (ABS I, paragraph 106, Table 1 of the patent in suit) instead of one (ABS component (B) in Table 1 of D10)

3.2.8 As laid out in section 3.2.5 of the present decision, it is established case law of the Boards that tests comparing the invention with the prior art have to be conducted in such a way that any effect relied upon to justify an inventive step can be attributed to the distinguishing feature. However, it is also permitted - and might even be necessary - to modify prior art embodiments in line with the invention to such a degree that the only remaining difference is the feature distinguishing the claim. Thus, comparative tests do not always have to be carried out using the closest prior art which means that intrinsic comparative tests can be used as evidence of an effect. What is ultimately of relevance is thus not only whether a causal link between a distinguishing feature over the

closest prior art and an effect was 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 was 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 could also be expected to take place 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).

3.2.9 In the present situation, while it can be acknowledged that the composition according to the non-inventive example 2 differs from that of example 6 of D10, it was not made apparent by the appellant that these differences were of any relevance for the effects shown in the patent in suit. In particular, a comparison of the properties reported in Table 1 of the patent in suit for the compositions of example 1 and non-inventive example 2 shows improved mechanical properties of the composition according to operative claim 1 in many respects (improved impact energy of molded plaque: 72 J for example 1 vs 64 J for non-inventive example 2; improved impact energy of metal plated molded plaque: 23 J for example 1 vs 17 J for non-inventive example 2; improved maximal impact force of plated plaque: 4300 N for example 1 vs 3600 N for non-inventive example 2; improved peel strength: 9.3 N/cm for example 1 vs 8 N/cm for non-inventive example 2; improved Hole size after impact 3 for example 1 vs 2 for non-inventive example 2 and improved classification of Dart Impact testing: yielding stable cracking for example 1 vs yielding unstable cracking for non-

inventive example 2). In how far the use of a mixture of two ABS polymers, one polycarbonate and one SAN polymer in the same relative quantities would have impacted all these improvements in any way was not shown, nor even made credible by the appellant. It was therefore not made apparent to the Board why it was expected by the appellant that the improvements in mechanical properties of the composition according to example 1, as compared to the ones of the composition according to non-inventive Example 2 of the patent in suit (that only differed from one another in the amounts of PC and SAN), would not be obtained in the context of the closest prior art, i.e. if the composition according to example 6 of D10 (instead of the one of non-inventive Example 2) had been considered for comparison and modified according to claim 1.

3.2.10 The same considerations apply to the amount of acrylonitrile in the SAN polymer which was additionally relied upon by the appellant in their argumentation that the comparison laid out in Table 1 of the patent in suit lacked fairness. The amount of acrylonitrile in the SAN polymer used in the compositions of example 1 and non-inventive example 2 of the patent in suit was 24.5 wt.-% (paragraph 110). The appellant argued that, since D10 limited the amount of acrylonitrile in the SAN polymers to the range of 18-22 wt.-%, the comparison made in the patent in suit that relied on SAN polymers having 24.5 wt.-% of acrylonitrile lacked relevance.

3.2.11 Claim 1 of D10 indeed limits the amount of vinyl cyanide monomers (to which acrylonitrile belongs) in the copolymer (C) (which corresponds to the SAN polymer (B) of the patent in suit) to a range of "about 18 wt.-% to about 22 wt.-%" (claim 1). The skilled reader of

D10 also learns from the passage in paragraphs 67 and 68 that with an amount in vinyl cyanide monomer within the above range in the copolymer (C) "excellent etching properties and plating adhesion may be effectively accomplished, and a graft copolymer (B) may be effectively dispersed". That passage however does not address the relation between the choice of acrylonitrile amount in the range of "about 18 wt.-% to about 22 wt.-%" and the mechanical properties of the composition. The amount of acrylonitrile as vinyl cyanide in the SAN polymers was indeed monitored in the examples of D10 (18.3-22.0 wt.-% in examples 1-6 and 15.0, 27.0, 23.0 and 33.0 wt.-% in comparative examples 1-4) and was the only relevant variable in these examples. The data in Table 2 of D10 show that the main property relevant in that document (plating adhesion) decreased continuously with increasing amounts of acrylonitrile over the whole range of 15.0 to 33.0, leading to the indication not to go beyond 22.0 wt.-%. No other effect is discussed in D10 and the mechanical properties of the compositions are not mentioned. The Board therefore does not find in D10 any indication or technical reason that the choice of amount in acrylonitrile in the SAN polymer would have any influence on the mechanical properties of the composition, even less an influence that would invalidate the conclusion drawn from the comparison of example 1 with non-inventive example 2 of the patent in suit.

3.2.12 In view of this analysis, the composition of non-inventive example 2 (45 wt.-% PC, 20 wt.-% SAN and 35 wt.-% ABS) can reasonably be seen as representative of the composition of example 6 of D10 (46 wt.-% PC and 29 wt.-% SAN and 25 wt.-% ABS) and the comparison of these examples shows that a composition with the amounts of

PC and SAN polymers according to operative claim 1 results in improved mechanical properties (impact and peel strength) compared to a composition representing that of example 6 of D10. The problem over D10 can therefore be formulated as the provision of a thermoplastic molding composition with improved mechanical properties (impact and peel strength).

3.2.13 The question of obviousness was whether the cited prior art showed that that effect was known to be achievable by the feature or combination of features distinguishing claim 1 over D10. In the present case, the question was whether the choice of amounts of polycarbonate and SAN polymer in the ranges defined in operative claim 1 would have been obvious to solve the problem posed.

3.2.14 D10 teaches that the amount in polycarbonate can be chosen in the range of 30-50 wt.-% (paragraph 36) and the amount of SAN polymer in the range of 20-60 wt.-% (paragraph 70) but D10 does not point to a combination of ranges as defined in claim 1 of the main request to obtain an improvement of mechanical properties. D10 therefore does not lead to the subject matter of operative claim 1.

3.2.15 The appellant also relied upon D11 (Figure 7 on page 15; section 5.2, pages 17 and 18), D12 (paragraph 4), D13 (paragraphs 1, 34, 35, 56 and claim 12) (statement of grounds of appeal, pages 25 and 26) as well as D14 (claim 1, paragraph 13 and polymers 1-6 in the examples) (letter of 14 February 2025, page 8).

(a) D11 is part of a book on styrenic copolymers that specifically deals with the preparation and properties of multiphase systems based on ABS and

SAN polymers. Figure 7 cited by the appellant suggests the properties a mix of SAN and ABS could have depending on their relative amounts and the amounts of monomers. Section 5.2 of D11 further addresses the influence of the presence of ABS polymers compared to SAN polymers. D11 is relevant to mixtures of ABS and SAN polymers but the passages cited in D11 do not deal with compositions additionally containing a polycarbonate. The teaching of D11 therefore is not relevant to the present question of inventive step because it cannot guide the skilled reader starting from example 6 of D10, containing 46 wt.-% of polycarbonate, towards compositions containing 25-34 wt.-% of that compound as required in operative claim 1.

- (b) D12 concerns thermoplastic compositions comprising from about 40 wt% to about 75 wt% of one or more polycarbonate resins, from about 24 wt % to about 53 wt% of a first impact modifier, and from about 1 wt % to about 7 wt % of a second impact modifier (claim 1). The first/primary impact modifier can be an ABS polymer or a SAN polymer (paragraphs 96 and 98). The second/secondary impact modifier can be an ABS polymer (paragraphs 101, 103 and 104). In this respect, D12 encompasses compositions based on a polycarbonate, a SAN and and an ABS polymer, as it is shown in example F1 in Table 4. It is however apparent from the overall teaching of D12 that the thermoplastic compositions always contain more than about 40 wt.-% polycarbonate. Claim 1 of D12 sets out a range of 40-75 wt.-% and the description consistently discloses a minimum amount of polycarbonate of 40 wt.-% (40-69 wt.-% in paragraph 47; 40-55 wt.-% in paragraph 67, 40-69 wt.-% in

paragraph 69). Even the examples contain more than 40 wt.-% polycarbonate, including example F1 which contains 44 wt.-% of that polymer. There is further no teaching in D12 that would suggest using an amount of polycarbonate below 40 wt.-%, in particular in the range of 25-34 wt.-% as defined in operative claim 1, in order to solve the problem of providing a thermoplastic molding composition with improved mechanical properties (impact and peel strength).

Paragraphs 144 and 154 of D12 were additionally cited by the appellant at the oral proceedings before the Board as relevant to the question of inventive step linked to the amount of polycarbonate in the thermoplastic composition. Paragraph 144 provides some teaching that is made in the context of the examples of D10 ("As illustrated in the following Examples, the disclosed thermoplastic compositions are especially useful as substrates in the manufacture of electroplated products"). The passage teaches that "Contrary to conventional understanding that increasing the level of polycarbonate in an impact modified polycarbonate blend reduces the corresponding electroplate adhesion value, the disclosed thermoplastic compositions exhibit an increasing electroplate adhesion value as the quantity of polycarbonate present in the blend also increases". It further adds that "it is believed the incorporation of the secondary impact modifier, such as a second butadiene-containing impact modifier, is responsible for this unexpected and surprising reverse behavior".

The Board finds it relevant to read that passage of D12 mentioning increasing levels of polycarbonate in view of the object of D12 with respect to the prior art. In this respect, it is stated in paragraph 5 that there "remains a need in the art for methods that enable the manufacture of PC/ABS blends exhibiting relatively increased levels of polycarbonate without reducing or adversely impacting the desired level of electroplate adhesion".

Although not explicitly mentioned in paragraph 144, it is understood that the increased levels of polycarbonate refer to amounts disclosed throughout D12 as being above about 40 wt.-% by contrast to amounts below that threshold used in the prior art. In this context the passage of paragraph 144 can only be read as meaning that the prior art would not have suggested amounts of polycarbonate as high as those disclosed in D12 but that it was the contribution of D12 that the presence of an ABS as a secondary impact modifier allowed for these higher amounts of polycarbonate without impacting the relevant properties of D12.

That teaching of paragraph 144 is confirmed in paragraph 154. That latter passage refers to the results shown in Figure 1 wherein amounts of polycarbonate of 48 wt.-%, 51 wt.-% and 54 wt.-% were used in thermoplastic compositions. Figure 1 shows, according to paragraph 154 of D10, that when a secondary impact modifier is used in addition to a primary impact modifier in compositions of increasing polycarbonate contents, the adhesion properties of the compositions are improved "[...] the presence of the secondary impact modifier also

unexpectedly enables an increase in adhesion value with increasing PC content". The teaching laid out in these paragraphs of D12 therefore would drive a skilled reader to increase the amount of polycarbonate in the thermoplastic composition of D10 comprising the three components rather than to lower it, as derivable from the increase in adhesion with the amount of polycarbonate illustrated in Figure 2. The Board therefore finds that D12 would not lead to operative claim 1 to solve the problem posed.

- (c) D13 concerns thermoplastic polycarbonate compositions which are impact-modified with ABS polymers (paragraph 1). The compositions of D13 contain 5-99 wt.-% of a polycarbonate, 1-95 wt.-% of an ABS polymer and optionally 0-50 wt.-% of a component that can be a SAN polymer (claim 1). Paragraphs 34 and 35 cited by the appellant concern the improvements in mechanical properties of PC/ABS compositions but they give no guidance as to the amount of these components that would motivate a skilled person starting from the composition of example 6 of D10 with 46 wt.-% of polycarbonate to lower the amount of polycarbonate to a range of 25-34 wt.-% in order to improve mechanical properties. Paragraph 56 of D13 additionally cited by the appellant discloses a range of 30-80 wt.-% of polycarbonate and gives no further hint towards the range defined in operative claim 1. D13 therefore does not lead to the subject-matter of operative claim 1.
- (d) D14 concerns compositions of ABS and SAN polymers (claim 1) that have good thermoplastic processability, and that can be used to make

moulded parts having a very high surface gloss (paragraph 13). The compositions of D14 may contain a polycarbonate (paragraphs 53-70) but D14 does not provide any hint towards improved mechanical properties linked to the amount of these polymers, nor can a hint be found in the examples including polymers 1-6 cited by the appellant since these polymers do not contain a polycarbonate. D14 therefore does not lead to operative claim 1.

3.2.16 On that basis, the Board concludes that the appellant has not shown that the subject-matter of claim 1 of the main request lacks an inventive step starting from example 6 of D10 in view of the prior art.

3.3 D12 as the closest prior art

3.3.1 The opposition division considered example F1 in D12 as alternatively representing the closest prior art for claim 1 of the main request. The appellant pursued that objection in appeal (statement of grounds of appeal, section 7) and at the oral proceedings before the Board relied on their arguments provided with respect to D10.

3.3.2 Both parties (statement of grounds of appeal, page 31; rejoinder, page 45) acknowledged that claim 1 of the main request differed from the composition of example F1 of D12 in

- (i) the use of two or more graft rubber polymers which are different in particle diameter d_{50} of the polymer latex (a) of the conjugated diene, and
- (ii) different amounts of polycarbonate, rubber free copolymer and graft rubber copolymer.

The Board has no reason to be of a different opinion.

- 3.3.3 The analysis of inventive step starting from example F1 of D12 was therefore similar to the one starting from example 6 of D10. The comparison of the compositions of example 1 and non-inventive example 2 is still relevant to the question of inventive step and shows the presence of an effect linked to the use of the amounts in polycarbonate, ABS and SAN polymers in the same manner as discussed above when starting from example 6 of D10. The problem over D12 therefore remains the provision of a thermoplastic molding composition with improved mechanical properties (impact and peel strength).
- 3.3.4 The appellant argued that starting from example F1 of D12 which disclosed a composition with 44 wt.-% of polycarbonate polymers, 28 wt.-% of ABS polymers and 28 wt.-% of SAN polymer, the skilled person would find in D12 or in D10 a teaching to lower the amount of polycarbonate to a value in the range of 25-34 wt.-% as defined in claim 1 of the main request.
- 3.3.5 It was argued that the teaching in paragraphs 4, 144 and 154 of D12 in particular was relevant to the question of lowering the amount of polycarbonate. However, as discussed in section 3.2.15b of the present decision, the Board finds that D12 teaches the use of polycarbonate in an amount above 40 wt.-% (claim 1), does not disclose any range of polycarbonate below that threshold and, if at all, hints to an increase in the polycarbonate content to improve adhesion properties.
- 3.3.6 The appellant also relied on the passage in paragraph 36 of D10 as one teaching amounts of polycarbonate of 30-50 wt.-% (statement of grounds of appeal, page 32).

The main teaching of D10 is to use a vinyl cyanide monomer in an amount of about 18 to 22 wt.-% in the copolymer (C) in order to impart excellent etching properties and plating adhesion to thermoplastic compositions (paragraphs 20, 67 and 68 and examples). While D10 also discloses that the use of a polycarbonate generally improves the mechanical properties of thermoplastic compositions (impact resistance, heat resistance, flexural properties and tensile properties in paragraph 28), there is no further teaching in D10 with respect to polycarbonates that would have drawn the skilled person to choose an amount of polycarbonate in the range of overlap (30 to 34 wt.-%), which is in the lower part of the range taught in D10, with the expectation to solve the problem, namely to improve the mechanical properties of the thermoplastic compositions of D12. It seems in that respect that on the contrary D10 would rather hint to the use of amounts of polycarbonates in the higher part of the range disclosed therein (30-50 wt.-%) especially since that higher part of the range would be congruent with the range laid out in D12 (40-75 wt.-% in claim 1).

- 3.3.7 The Board therefore concludes that the appellant has not shown that the subject-matter of claim 1 of the main request lacks an inventive step starting from D12 as closest prior art.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:



D. Hampe

D. Semino

Decision electronically authenticated