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**Datasheet for the decision  
of 10 December 2024**

**Case Number:** T 0315/23 - 3.3.03

**Application Number:** 10185812.4

**Publication Number:** 2277946

**IPC:** C08L33/04

**Language of the proceedings:** EN

**Title of invention:**

ACRYLIC BLENDS

**Patent Proprietor:**

Mitsubishi Chemical UK Limited

**Opponent:**

ARKEMA FRANCE

**Relevant legal provisions:**

EPC Art. 56

**Keyword:**

Inventive step - (main request: no; auxiliary request 1: yes)

**Decisions cited:**

T 0035/85, T 0197/86, T 3272/19, T 0602/21



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Case Number: T 0315/23 - 3.3.03

**D E C I S I O N**  
**of Technical Board of Appeal 3.3.03**  
**of 10 December 2024**

**Appellant:** ARKEMA FRANCE  
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**Decision under appeal:** **Interlocutory decision of the Opposition  
Division of the European Patent Office posted on  
15 December 2022 concerning maintenance of the  
European Patent No. 2277946 in amended form.**

**Composition of the Board:**

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

## **Summary of Facts and Submissions**

- I. The appeal of the opponent lies from the interlocutory decision of the opposition division posted on 15 December 2022 concerning maintenance of European patent No. 2 277 946 in amended form according to the claims of auxiliary request 8, which was filed as auxiliary request 18 with letter of 23 September 2022.
- II. The following documents, among others, were cited in the decision under appeal:
- D4: EP 0 781 808 A2  
D9: WO 00/78863 A2  
D13: Declaration of Mr P. Eustace with the date indication "01-05-19"
- III. In a first appeal related to the patent in suit (decision T 3272/19, of 11 February 2021), the subject-matter of claim 1 of the then pending main request and auxiliary requests 1 to 4 was found to be not novel over the examples of document D9. The then pending auxiliary request 5 was held to meet the requirements of Articles 76 and 123(2) EPC as well as those of sufficiency of disclosure and the case was remitted to the opposition division for further prosecution.
- IV. In so far as relevant to the present case, the following conclusions were reached in the decision under appeal underlying the present case:
- While the then pending auxiliary requests 5 and 6 were not allowable, auxiliary request 7 was not admitted.

- The then pending auxiliary request 8 (which had been filed as auxiliary request 18 with letter of 23 September 2022) was admitted into the proceedings and the objections of lack of novelty raised against it in view of several documents, including D4, were rejected.
- The subject-matter of the claims of auxiliary request 8 involved an inventive step when document D9 was taken as the closest prior art. Although D4 was not a suitable document to be taken as the closest prior art, an inventive step was also present if D4 were to be considered as such.

For these reasons, the patent amended on the basis of auxiliary request 8 was held to meet the requirements of the EPC.

- V. The opponent (appellant) lodged an appeal against that decision. In the statement of grounds of appeal, the appellant made reference *inter alia* to document D9a (AU 200066877 B2), which is a document belonging to the patent family of D9 that was already referred to in the first appeal proceedings (see point IV of the Facts and Submissions of decision T 3272/19).
- VI. With the rejoinder to the statement of grounds of appeal, the patent proprietor (respondent) filed a set of claims as auxiliary request 1.
- VII. The parties were summoned to oral proceedings and a communication pursuant to Article 15(1) RPBA indicating specific issues to be discussed at the oral proceedings was then sent to the parties.

VIII. With letter of 21 November 2024 the respondent stated that they would not attend the oral proceedings and withdrew their request for oral proceedings.

IX. Oral proceedings were held on 10 December 2024, as announced, in the presence of the sole appellant.

X. **The final requests of the parties were as follows:**

(a) The appellant requested that the decision of the opposition division be set aside and that the patent be revoked.

(b) The respondent requested in writing that the appeal be dismissed (main request) or, in the alternative, that the patent be maintained in amended form according to the claims of auxiliary request 1 filed with the rejoinder to the statement of grounds of appeal.

XI. Claim 1 of the **main request**, which is the sole claim of that request relevant for the present decision, read as follows (whereby the features are presented separately by the Board to facilitate the reading):

"1. Use of an acrylic polymer composition comprising a melt blend of a thermoplastic high molecular weight acrylic material (HMWA) and a thermoplastic low molecular weight acrylic material (LMWA),

at least 70% w/w, based on the total weight of the HMWA, of the said HMWA comprising an alkyl (alk)acrylate (co)polymer, the said (co)polymer comprising at least 80% w/w of a first polymer unit derived from C<sub>1</sub>-C<sub>12</sub> alkyl (C<sub>1</sub>-C<sub>8</sub> alk)acrylate monomer units and up to 8% w/w, based on the said alkyl

(alk)acrylate (co)polymer of a first copolymer unit derived from C<sub>1</sub>-C<sub>12</sub> alkyl(C<sub>0</sub>-C<sub>8</sub> alk) acrylate and/or (C<sub>0</sub>-C<sub>8</sub> alk)acrylic acid monomer units,

the said HMWA having a weight average molecular weight of between 40k Daltons and 1000k Daltons,

at least 70% w/w, based on the total weight of the LMWA, of the said LMWA comprising an alkyl(alk)acrylate (co)polymer, the said (co)polymer comprising at least 80% w/w of a second polymer unit derived from C<sub>1</sub>-C<sub>12</sub> alkyl (C<sub>1</sub>-C<sub>8</sub> alk)acrylate monomer units and up to 8% w/w, based on the said alkyl (alk)acrylate (co)polymer of a second copolymer unit derived from C<sub>1</sub>-C<sub>12</sub> alkyl (C<sub>0</sub>-C<sub>8</sub> alk)acrylate and/or (C<sub>0</sub>-C<sub>8</sub> alk)acrylic acid monomer units,

the said LMWA having a weight average molecular weight of between the entanglement molecular weight (M<sub>e</sub>) (expressed in k Daltons) and 250k Daltons,

with the proviso that the HMWA has a higher M<sub>w</sub> than the LMWA,

to provide a high T<sub>g</sub> melt blended composition or moulded polymer product, wherein the product is optionally impact modified, and wherein the acrylic polymeric composition comprises, based on the weight of the acrylic polymeric composition, up to 55% w/w of LMWA and at least 40% w/w of HMWA."

XIII. Claim 1 of **auxiliary request 1** differed from claim 1 of the main request in that it contained the following additional feature:

"and wherein the weight ratio of HMWA:LMWA in the

composition is greater than 7:3".

XIII. The appellant's arguments, in so far as they are pertinent for the present decision, may be derived from the reasons for the decision set out below. They essentially argued that the subject-matter of claim 1 of each of the main request and auxiliary request 1 did not involve an inventive step when either D9 or D4 was taken as the document constituting the closest prior art.

XIV. The respondent's arguments, in so far as they are pertinent for the present decision, may be derived from the reasons for the decision given below. They essentially considered that the subject-matter of claim 1 of each of the main request and auxiliary request 1 involved an inventive step when D9 was taken as the document constituting the closest prior art. In addition, the respondent considered that D4 did not constitute a suitable document to be taken as the closest prior art. However, according to the respondent, an inventive step was also given if D4 were to be considered as a starting point for the assessment of inventive step.

## **Reasons for the Decision**

### **Main request - Auxiliary request 8 dealt with in the decision under appeal**

1. The operative main request is auxiliary request 8 which was dealt with in the decision under appeal. Whereas the conclusions on novelty reached by the opposition division were not contested on appeal, the appellant

disagreed with the findings of the opposition division regarding inventive step when taking either document D9 or document D4 as the closest prior art.

2. Article 56 EPC - D4 as the closest prior art

2.1 Taking D4 as the closest prior art

2.1.1 Whereas the appellant considered that D4 was a suitable document to be taken as the closest prior art, the respondent adhered to the opposition division's view that it was not (reasons: page 16, last line to page 17, sixth lines; rejoinder: points 3.5.1 and 3.5.2).

2.1.2 In this respect, according to established case law, the closest prior art for assessing inventive step is a prior art document disclosing subject-matter conceived for the same purpose or aiming at the same objective as the claimed invention and having the most relevant technical features in common, i.e. requiring the minimum of structural modifications (Case Law of the Boards of Appeal of the EPO, 10th edition, 2022, I.D.3.1).

2.1.3 In the present case, the patent in suit deals with blends of low molecular weight acrylic polymers with high molecular weight acrylic polymers, whereby the blends exhibit good processability during injection or extrusion moulding, i.e. good performance in terms of melt flow (sufficiently high melt flow index) and thermal resistance (sufficiently high glass transition temperature  $T_g$ ) (paragraphs 1, 2, 74-81, 110 and 111).

2.1.4 It was not in dispute between the parties that the compositions prepared in the examples of D4 are also



directed to blends of acrylic polymers comprising two components corresponding to the HMWA and LMWA components of claim 1 of the main request, whereby said compositions are suitable for injection moulding since bars are moulded therefrom (D4: page 6, line 36; see also page 9, lines 19-20). The Board sees no reason to be of a different opinion. Under these circumstances, although it is correct that D4 does not explicitly disclose the use of such compositions "to provide a high Tg melt blended composition or moulded polymer product", the Board considers that D4 is not so unrelated to the patent in suit that it would be disregarded by the skilled person confronted with the problem addressed by the patent in suit.

- 2.1.5 The fact that D9/D9a may be another suitable document to be taken as the closest prior art (as was held in the decision under appeal and remained undisputed in appeal) and/or the fact that the relevant disclosure of D9/D9a may be "closer" to the subject-matter being claimed do(es) not constitute sufficient reasons to conclude that D4 may not constitute a reasonable starting point for the assessment of inventive step. Indeed, it is established case law that if the skilled person has a choice between several workable routes, i.e. routes starting from different documents, which might lead to the invention, the rationale of the problem and solution approach requires that the invention be assessed relative to all these possible routes, before an inventive step can be acknowledged (Case Law, *supra*, I.D.3.1, see in particular the sixth paragraph). Therefore, the considerations of the respondent and the opposition division in that regard are rejected.

2.1.6 For these reasons, the Board shares the appellant's view that D4 is a document that can be suitably taken as the closest prior art for the assessment of inventive step.

## 2.2 Distinguishing features

The appellant's objection was based on the disclosure of examples 6B to 6E (D4: table 3, in which the polymer prepared in example 5A of D4 and the SLP Additive corresponded, respectively, to the LMWA and HMWA components of claim 1 of the main request). It was further common ground that, as already concluded in the decision of the opposition division (reasons: point 5.2 and 8.3.1; see also page 17, second full paragraph), the subject-matter of claim 1 of the main request differed from the disclosure of these examples only in the amounts of the HMWA and LMWA components present in the composition (statement of grounds of appeal: page 8, second full paragraph). These considerations were communicated to the parties in the Board's communication (section 8.2) and remained uncontested. Therefore, the Board has no reason to depart from them.

## 2.3 Problem solved

2.3.1 As indicated by the opposition division (decision under appeal: middle of page 17) and undisputed in appeal, there is no fair comparison on file between the subject-matter being claimed and compositions according to examples 6B to 6E of D4.

2.3.2 However, the respondent argued that, even in the absence of such a fair comparison, the skilled person would expect by common general knowledge that using lower amounts of HMWA components would lead to lower Tg

and longer cooling cycle time (rejoinder: point 3.5.5). That view, which is reasonable, was not contested by the appellant.

2.3.3 In view of the above, the Board is satisfied that the problem solved over D4 resides in the use of an acrylic composition having reduced cooling cycle time.

2.4 Obviousness

2.4.1 The question to be answered is whether the skilled person desiring to solve the problem(s) identified above would have modified the disclosure of the closest prior art, possibly in combination with other prior art or with common general knowledge, to arrive at the claimed subject matter.

2.4.2 In this respect, since the improvement in terms of cooling cycle time in relation to a higher amount of HMWA component relied on by the respondent has been taken up for the formulation of the problem effectively solved for the reason that it would be expected by the skilled person (as indicated in point 2.3.2 above), it can only be considered - for the same reason - as obvious. In addition, it would further be obvious to use any suitable amounts of HMWA and LMWA disclosed in D4, in particular amounts according to claim 1 of the main request which are e.g. compatible with the disclosure of claim 1 of D4. Indeed, while the compositions of claim 1 of the main request can comprise "up to 55 wt.%" of the low molecular weight component LMWA and "at least 40 wt.%" of the high molecular weight component HMWA, the compositions of claim 1 of D4 should comprise from 50 to 99 wt.% of the low molecular weight component and from 1 to 50 wt.% of the high molecular weight component.

2.4.3 As an aside, if it were considered that the effect of the quantity of HMWA were not expected by the skilled person, the problem should be formulated as the provision of the use of an alternative composition and the considerations based on D4 would be equally valid.

2.5 For these reasons, the subject-matter of claim 1 of the main request does not involve an inventive step when D4 is taken as the document constituting the closest prior art. As a consequence, the main request is not allowable.

**Auxiliary request 1**

2.6 Article 56 EPC - D4 as the closest prior art

2.6.1 The subject-matter of claim 1 of auxiliary request 1 differs from the one of claim 1 of the main request in that the weight ratio of the HMWA component to the LMWA component was specified to be "greater than 7:3". Therefore, this amendment imposes that the high molecular weight component HMWA is present in majority (as compared to the LMWA component) and in an amount at least 2.33 times higher than the amount of the low molecular weight component LMWA.

2.6.2 The amendment made in terms of the HMWA:LMWA ratio is not satisfied by the compositions of examples 6B-6E considered in point 2.2 above and, therefore, constitutes an additional feature that distinguishes the subject-matter of claim 1 of auxiliary request 1 from the disclosure of examples 6B to 6E of D4.

2.6.3 However, considering that said additional distinguishing feature was not argued by the respondent

to be related to any technical effect, the problem effectively solved by claim 1 of auxiliary request 1 over D4 remains the same as the one defined above for claim 1 of the main request.

2.6.4 Regarding the obviousness of the solution it must be taken into account that the teaching of D4 is directed to compositions in which the high molecular weight component is present as a minority component in the composition (see e.g. claim 1 of D4, in which components a) and b) disclosed therein correspond to the LMWA and HMWA components of claim 1 of auxiliary request 1, respectively). Therefore, in order to arrive at the subject-matter of claim 1 of auxiliary request 1 and in particular at the ratio HMWA:LMWA now specified therein (see the amount of HMWA at least 2.33 times higher than the amount of LMWA in 2.6.1, above), the skilled person would have to go fully against the teaching of D4. This, in the Board's view, cannot be considered to constitute an obvious modification of the disclosure of examples 6A to 6E of D4. Rather, such a modification would only be carried out based on hindsight, which is not allowable. In this regard, the Board in particular does not share the appellant's opinion that such a modification constitutes an obvious routine variation of the examples of D4 (appellant's letter of 7 October 2024: point II, second paragraph).

2.6.5 For these reasons, the subject-matter of claim 1 of auxiliary request 1 involves an inventive step when document D4 is taken as the closest prior art.

3. Article 56 EPC - D9 as the closest prior art

3.1 Closest prior art - Distinguishing features

3.1.1 It was common ground that:

- D9 constitutes an appropriate document to be taken as the closest prior art, wherein the two compositions prepared in the examples of D9 (pages 9-10 and table on page 11) and comprising an impact reinforced high molecular weight methyl methacrylate copolymer, either 5 or 10 wt. % of a lower molecular weight methyl methacrylate copolymer and a core shell modifier are particularly relevant, in particular because they exhibit improved processability (melt flow) and good heat resistance (Vicat temperature) as compared to a composition comprising no lower molecular weight methyl methacrylate copolymer.
  
- Considering that the high and low molecular weight methyl methacrylate copolymers of the examples of D9 correspond to the HMWA and LMWA components defined in claim 1 of the main request, the subject-matter of claim 1 of auxiliary request 1 differs from the disclosure of these examples of D9 only in the lower comonomer content of both the HMWA and the LMWA components (both of which should be "up to 8% w/w" in claim 1 of auxiliary request 1, whereas the high and low molecular weight methyl methacrylate copolymers of both examples of D9 have a comonomer content of 9 wt.% and 15 wt.%, respectively).

3.1.2 There is no reason for the Board to deviate from that view (see decision under appeal: point 5.1 of the reasons; see also the analysis of the disclosure of the examples of D9 in points 2.2 to 2.6 of the reasons of T 3272/19). In particular, that analysis of the disclosure of D9 was indicated in the Board's

communication (point 7.1) in respect of the main request and remained undisputed. Also, it was not argued by the parties that the amendment made in claim 1 of auxiliary request 1 (as compared to claim 1 of the main request) constituted an additional distinguishing feature and/or was related to any effect (rejoinder: point 4.2; appellant's letter of 7 October 2024: page 2, penultimate paragraph) and the Board sees no reason to be of a different opinion.

3.2 Problem effectively solved over the closest prior art

3.2.1 The parties disagreed as to how the problem effectively solved should be formulated.

a) The respondent considered that this problem resided either in the provision of a composition with improved cooling time (in agreement with the opposition division: see decision, bottom of page 15 to top of page 16) or in a composition having good melt flow in combination with improved cooling time (rejoinder: points 3.3.4 to 3.3.7). In both cases, the respondent considered that the examples of D13 showed that the said problems were effectively solved.

b) However, the appellant was of the opinion that D13 did not support the improvement relied upon by the respondent (statement of grounds of appeal: section 3.c) starting on page 11 in full; letter of 7 October 2024: page 3, first paragraph). Therefore, according to the appellant, the problem solved should be formulated as merely residing in the provision of an alternative composition (statement of grounds of appeal: section 3.d) on page 12; letter of 7 October 2024: page 3, second paragraph).

3.2.2 In this respect, the Board considers that, since the subject-matter of claim 1 of the operative main request is a use claim and not a product claim directed to a composition, the problem effectively solved over D9 cannot reside in the provision "of a composition", contrary to the respondent's line of defence.

3.2.3 Document D13 is directed to compositions prepared by the respondent in order to compare the performance of compositions as claimed with compositions according to D9. The comparison was made between the compositions prepared in examples A and B - both illustrative of the subject-matter of claim 1 of auxiliary request 1 - with the ones prepared in examples C and D - for comparison purposes -, respectively. These compositions were as follows (tables 3 and 4 of D13):

**Table 3 - Polymer composition**

Polymer	Polymer type	Methyl methacrylate (% w/w)	Ethyl acrylate (EA) (% w/w)	Mw kDa
HMWA	HMWA (i)	97	3	>70
	HMWA (ii)	89	11	>70
LMWA	LMWA (i)	97	3	<70
	LMWA (ii)	89	11	<70

**Table 4 - Example composition**

Example	HMWA type	HMWA wt%	LMWA type	LMWA wt%	Impact Modifier <sup>1</sup> wt%
A	HMWA (i)	74.0	LMWA (i)	18.5	7.5
B	HMWA (i)	78.6	LMWA (i)	13.9	7.5
C	HMWA (ii)	74.0	LMWA (ii)	18.5	7.5
D	HMWA (ii)	78.6	LMWA (ii)	13.9	7.5

<sup>1</sup>a commercial grade acrylic core/shell impact modifier



Straight bars were injection moulded from these compositions and the cooling cycle time determined (D13: table 5). In this regard, it was not contested that examples A and B of D13 illustrate the subject-matter of claim 1 of auxiliary request 1 and the Board sees no reason to be of a different opinion. The Board is further satisfied that it can be inferred from tables 3 and 4 of D13 that examples C and D thereof can be fairly compared to said examples A and B, respectively, and differ therefrom only in that lower amounts of comonomer (ethyl acrylate) are used in both the HMWA and the LMWA components (3 wt.% in examples A and B vs. 11 wt.% in examples C and D). In view of this, it is further pointed out that the compositions illustrative of claim 1 of auxiliary request (compositions A and B) differ from the compositions used for comparison (compositions C and D) in the distinguishing features identified in point 3.1.1, second bullet point, above: whereas the compositions illustrative of the invention have an HMWA and an LMWA component with an amount of comonomer of up to 8 wt.%, this is not the case for both the HMWA and the LMWA components of the comparative compositions. In addition, the Board agrees with the respondent and the opposition division that the results of tables 3 to 5 of D13 show that the limited amount of comonomers as defined in claim 1 of auxiliary request 1, as compared to amounts of comonomers outside the range specified in said claim 1, lead to a reduced cooling time, thereby allowing shorter cycle times during the moulding process (minimum cooling time for examples A and B: 26 s and 25 s, respectively vs. 41 s and 39 s for examples C and D, respectively).

3.2.4 The appellant argued that D13 should not be relied upon because it did not provide any MFI data (statement of

grounds of appeal: page 11, point i)). However, it is not clear to the Board why the fact that D13 does not provide such information could be relevant. In addition, the respondent's arguments in this respect (rejoinder: point 3.3.6) according to which the maintenance of good melt flow properties was reflected by the fact that all the examples of D13 were carried out with the same injection cycle time and conditions is reasonable and were not contested by the appellant.

3.2.5 The appellant further put forward that the comparative data in D13 did not reflect the difference between the subject-matter being claimed and D9. In particular, a comonomer was used in D13 different from the one in the relevant examples of D9 (statement of grounds of appeal: paragraph bridging pages 11-12). During the oral proceedings before the Board, the appellant further indicated that the amounts of LMWA and HMWA components and of comonomers of the HMWA and LMWA components used in D13 were different from the ones used in the relevant examples of D9. Therefore, according to the appellant, the comparison made in D13 was not illustrative of the disclosure of the closest prior art and did not allow to draw any conclusion regarding the achievement of an improvement over said closest prior art.

a) However, it was not contested by the appellant that the comparative examples of D13 are according to the general teaching of D9 and that they differ from the examples of D13 illustrating the subject-matter being claimed in the above indicated distinguishing features. In that respect, it is established case law (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) that the patent proprietor (here, the

respondent) may discharge his 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. In that respect, 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. In the Board's view, these requirements are met by the comparison made by the respondent in D13.

b) In addition, the appellant has not provided any evidence or argument to explain why the effect shown in D13 would not be credible in the context of the relevant examples of D9 taken as the closest prior art.

c) For these reasons, the Board considers that the respondent has made it credible with D13 that the above identified distinguishing features are related to a (further) reduction of the cycle time (as compared to the closest prior art), in particular of the cooling cycle time. With respect to the latter, the Board considers that D9 makes available to the public that the polymer blend disclosed therein, when used as described, achieves the effect of a reduced cooling cycle time composition for the reasons set out in point 2.5.4 (in full) of decision T 602/21, which relates to a case parallel to the present one (document D3a mentioned in these passages of decision T 602/21 is

document D9a of the present proceedings; it is noted that paragraphs 74-75 of the present patent in suit are identical to paragraphs 71-72 of the patent in suit at stake in T 602/21, which are cited in point 2.5.4.a of T 602/21). In this respect, it is pointed out that said point of view was indicated in the Board's communication (point 7.2.2.d, fourth paragraph) and remained undisputed. Therefore, the Board has no reason to deviate from its preliminary considerations.

d) The appellant further argued that the comparison made between examples A and B with examples C and D, respectively, of D13 at most illustrated a reduction in cooling cycle time between compositions comprising either 11 wt.% or 3 wt.% comonomer in both the HMWA and the LMWA components. However, this comparison was not representative of the 9 wt.% vs. 8 wt.% or of 15 wt.% vs. 8 wt.% difference, which would be necessary in order to provide a fair comparison with the disclosure of the relevant examples of D9 that constitute the closest prior art. In particular, according to the appellant, the data of D13 were not sufficient to render credible that the effect claimed by the respondent was achieved over the whole breadth of the claim (appellant's letter of 7 October 2024: page 3, first paragraph; oral proceedings before the Board).

However, this argument of the appellant is not supported by any evidence and, for that reason, is not suitable to demonstrate that the improvement shown in D13 is not achieved over the whole breadth of claim 1 of auxiliary request 1. In particular, considering that the comparison of examples A and B with examples C and D, respectively, of D13 is held by the Board to demonstrate an improvement in terms of shorter cycle times during the moulding process as a result of a

lower comonomer content in the two components, it would have been the duty of the appellant to provide evidence to the contrary in order to refute the presumption created by D13 that the features distinguishing the subject-matter of claim 1 of auxiliary request 1 from the disclosure of the closest prior art are related to a technical effect. In the absence of such evidence, the appellant's argument did not succeed.

e) In view of the above, the problem solved by claim 1 of auxiliary request 1 over the relevant examples of D9 resides in the use of another acrylic polymer composition to (further) reduce the cooling cycle time during injection moulding processes as compared to the composition according to the examples of D9 containing either 5 or 10 wt.% of the low molecular weight component.

### 3.3 Obviousness

3.3.1 The question remains whether the skilled person, desiring to solve the problem identified above, would have modified the disclosure of the closest prior art, possibly in combination with other prior art or with common general knowledge, to arrive at the claimed subject matter.

3.3.2 In this respect, it has not been shown that D9 contains any indication how to reduce cooling cycles during injection moulding processes, let alone teach that any effect can be achieved by reducing the amounts of comonomers in the high molecular weight component and the low molecular weight component as disclosed therein.

3.3.3 The appellant put forward that the skilled person would have solved the above problem by reducing the amounts of comonomer content based on common general knowledge (statement of grounds of appeal: point ii) on pages 13-14). In particular, the appellant considered that it was acknowledged in the patent in suit itself (paragraphs 2 and 84) that it was known in the art that decreasing the amount of comonomer in the acrylic polymers used in the relevant examples of D9 would lead to an increase in glass transition temperature Tg. Therefore, according to the appellant, it was obvious to the skilled person to solve the problem posed by decreasing the amount of comonomer in both acrylic polymer components used in the relevant examples of D9.

a) In this regard, although the Board was not convinced by the reading of paragraph 2 of the patent in suit proposed by the appellant, it is agreed that it is indicated at least in paragraph 84 of the patent in suit that the improvement claimed to be achieved by the patent in suit differs from an "alternative method for increasing the melt flow index" based on increasing the content of acrylate comonomer in the copolymer. The Board further notes that the disclosure of paragraph 84 as a whole was further acknowledged by the respondent themselves to illustrate known prior art methods where an increase in melt flow index was achieved by an increase of comonomer content while at the same time reducing Tg (rejoinder: point 3.2, first paragraph). Under these circumstances, there is no reason for the Board to reject the appellant's view that the disclosure of paragraph 84 of the patent in suit illustrates a method of the prior art to increase melt flow index which is known to the skilled person working in the present technical field and which implies that a reduction of comonomer content would have the opposite

effects (including an increase of Tg corresponding to a reduction in cooling time). It is further noted that the combination of D9 with that passage of the patent in suit made by the appellant was not objected to by the respondent as being unreasonable or based on hindsight. Therefore, the Board is also satisfied that such a disclosure may be read in combination with the one of D9, as was done by the appellant.

b) On the basis of paragraph 84 of the patent in suit, it can therefore be agreed with the appellant that the skilled person knew that decreasing the amount of comonomer in the acrylic polymers used in the relevant examples of D9 would lead to an increase in the glass transition temperature Tg (which would be beneficial in terms of reduced cooling cycle time during injection moulding processes). However, it must also be taken into account that it is explicitly mentioned in said paragraph 84 of the patent in suit that a variation in Tg is accompanied by a simultaneous variation in melt flow index in the opposite direction. Therefore, if the skilled person had considered reducing the amount of comonomers in the two acrylic polymers used in the relevant examples of D9, s/he would have expected that the melt flow index would also decrease. This finding is eventually confirmed by point 12 of D13, according to which the skilled person in the field of injection moulding PMMA-based compositions would expect that a reduction in the comonomer level of a PMMA-based copolymer would lead to a reduction in the melt flow.

However, it is a specific requirement of the invention according to D9 that the compositions prepared therein must have sufficiently high melt flow properties, defined in claim 1 of D9 as a melt volume-flow rate MVR (230°C/3.8 kg) according to ISO 1133 of at least

11 cm<sup>3</sup>/10 min.

Considering that the example of D9 carried out with 5 wt.% low molecular weight component has an MVR parameter of 11.1 cm<sup>3</sup>/10 min (table on page 11 of D9), which is at the lower end of the range targeted in D9, the skilled person would certainly not be motivated to reduce the amount of comonomers in both acrylic polymer components used in this example, as this would be expected to result in compositions with insufficient melt flow properties. This is particularly evidenced by the data in table 6 of D13: these data show - albeit for a type of acrylic polymer different from the one used in D9 - that reducing the amount of comonomers results in a significant reduction in the melt flow index, with the reduction being particularly significant for comonomer amounts between 13.0 wt.% and 11.0 wt.% as compared to between 11.0 wt.% and 3.0 wt.%. In view of this, starting from the disclosure of the example of D9 with 5 wt.% low molecular weight component that exhibits a MVR of 11.1 cm<sup>3</sup>/10 min, the reduction in comonomer contents that is required to arrive to the subject-matter of claim 1 of auxiliary request 1 (namely to go from 15 wt.% to 8 wt.% or lower for the amount of comonomer of the low molecular weight component and to go from 9 wt.% to 8 wt.% or lower for the amount of comonomer of the high molecular weight component of D9) would be expected to lead to a reduction in melt flow properties in such an amount that the MVR aimed at in D9 (at least 11 cm<sup>3</sup>/10 min) would not to be achieved any more. For that reason, such a reduction in the comonomer content in both the high molecular weight component and low molecular weight component of that example of D9 is not obvious.

It is true that the example of D9 carried out with



10 wt.% of the low molecular weight component has a melt flow rate of 13.0 cm<sup>3</sup>/10 min (table on page 11 of D9) which is more distant from the lower end of the range of melt flow rate (11 cm<sup>3</sup>/10 min) required in D9. However, the concerns indicated above remain valid as the skilled person would expect a drop in melt flow properties and could not exclude, in view of the evidence on file, that the reduction of the amounts of comonomers required in order to arrive at an HMWA and LMWA as defined in claim 1 of auxiliary request 1 would lead to a melt flow rate which is below the minimum requirement defined in claim 1 of D9. In particular, the appellant has not provided any evidence (nor any convincing argument) that in doing so, the melt flow rate would remain higher than 11 cm<sup>3</sup>/10 min.

Under these circumstances, the Board shares the respondent's view that in view of the requirements of D9 regarding minimum melt flow rates and in view of the borderline melt flow rates achieved by the relevant examples of D9, the skilled person would not consider it obvious to modify the compositions of the relevant examples of D9 towards comonomer levels in both polymeric components in the range of 8 wt.% or lower as defined in claim 1 of auxiliary request 1 as they would expect the melt flow rate to possibly drop below the minimum level required by the teaching of D9 (rejoinder: page 9, penultimate paragraph of point 3.3.8).

c) At the oral proceedings before the Board, the appellant put forward that, should the required reduction in the amounts of comonomers in the relevant examples of D9 be found to lead to insufficient melt flow rate, it would have been obvious to the skilled person to compensate for that effect by increasing the

amount of low molecular weight component, thereby increasing the melt flow. However, this argument is not supported by any facts and is therefore not persuasive. In particular, in the absence of any evidence to support that argument, it cannot be concluded that it would be obvious to the skilled person to remain in the range of melt flow index required in D9 by reducing the amount of comonomers in both acrylic polymer components used in the relevant examples of D9 to an amount of 8 wt.% or less.

d) For these reasons, the appellant's objection based on the combination of D9 with common general knowledge (as derivable from paragraph 84 of the patent in suit) is not persuasive.

3.3.4 Regarding the appellant's arguments based on the combination of D9 with D4 (see e.g. page 13, second full paragraph of the statement of grounds of appeal), the Board considers that the teachings of these documents are not compatible with each other for the following reason: whereas D9 is related to compositions comprising at least 80 wt.% of the HMWA component (see e.g. claim 1), D4 is directed to compositions comprising at most 50 wt% thereof (see e.g. claim 1). Under these circumstances, there is no reason to assume that any teaching/beneficial effect that would be shown for compositions according to D4 would necessarily apply to the compositions according to D9. Therefore, for that reason alone, the combination of these documents is not obvious and the appellant's argument in that respect is not convincing. In addition, although D4 is directed to blends having an excellent combination of mechanical properties and flow behaviour for moulding and shaping articles (particularly in injection moulding processing), it was not shown that

D4 addresses the technical problem defined above, namely how to (further) reduce the cooling cycle time during injection moulding processes (see statement of grounds of appeal: page 13, second full paragraph; appellant's letter of 7 October 2024: paragraph bridging pages 4 and 5).

- 3.3.5 For these reasons, the Board considers that the teaching of D9, either alone or in combination with common general knowledge or D4 does not render it obvious to solve the problem posed by reducing the comonomer content in both the high and the low molecular weight components used in the relevant examples of D9 to reach an amount of 8 wt.% or below (which would be necessary in order to arrive to the range of up to 8 wt.% defined in claim 1 of auxiliary request 1).
- 3.3.6 In view of the above, the subject-matter of claim 1 of auxiliary request 1 is considered to involve an inventive step when taking document D9 as the closest prior art and it is not justified that the Board overturns the decision of the opposition division in this regard.
4. Since the objections put forward by the appellant in respect of auxiliary request 1 are not successful, the decision under appeal is to be set aside and the patent is to be maintained in amended form on the basis of the claims of said auxiliary request 1 after any consequential amendment of the description.

## Order

### For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the opposition division with the order to maintain the patent in amended form on the basis of the claims of auxiliary request 1 filed with the rejoinder to the statement of grounds of appeal after any necessary consequential amendments of the description.

The Registrar:

The Chairman:



D. Hampe

D. Semino

Decision electronically authenticated