Internal distribution code:

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

Datasheet for the decision of 29 May 2015

Case Number: T 0129/12 - 3.3.06

Application Number: 00988046.9

Publication Number: 1250404

IPC: C10L1/16, C10L1/198, C10L1/238, C10L10/04

Language of the proceedings: EN

Title of invention:
Method of controlling injector deposits in direct injection gasoline engines using a fuel composition comprising a Mannich base detergent

Patent Proprietor:
Afton Chemical Intangibles LLC

Opponent:
Lubrizol Limited

Headword:
Injector deposits control / AFTON

Relevant legal provisions:
EPC Art. 52(1), 54, 56, 114(2)
RPBA Art. 12(4)

Keyword:
Late-filed document not admitted by the Opposition Division - not admitted : no reason to overrule the Opposition Division's discretionary decision
Late-filed documents - admitted: timely reactions to preceding objections/ submissions
Late-filed documents - not admitted: no timely reaction to some immediately preceding objections/submissions
Novelty - yes: analysability of allegedly commercialised product not proven
Inventive step - yes: non-obvious improvement

Decisions cited:
G 0001/92

Catchword:

Europäisches Patentamt
European Patent Office
Office européen des brevets

Beschwerdekammern
Boards of Appeal
Chambres de recours

European Patent Office
D-80298 MUNICH
GERMANY
Tel. +49 (0) 89 2399-0
Fax +49 (0) 89 2399-4465

Case Number: T 0129/12 - 3.3.06

D E C I S I O N
of Technical Board of Appeal 3.3.06
of 29 May 2015

Appellant: (Opponent)	Lubrizol Limited The Knowle Nether Lane Hazelwood Derby Derbyshire, DE56 4AN (GB)
Representative:	Mallalieu, Catherine Louise D Young & Co LLP 120 Holborn London EC1N 2DY (GB)
Respondent: (Patent Proprietor)	Afton Chemical Intangibles LLC 330 South Fourth Street Richmond, Virginia 23219 (US)
Representative:	Duckworth, Timothy John J A Kemp 14 South Square Gray's Inn London WC1R 5JJ (GB)
Decision under appeal:	**Decision of the Opposition Division of the European Patent Office posted on 18 November 2011 rejecting the opposition filed against European patent No. 1250404 pursuant to Article 101(2) EPC.**

Composition of the Board:

Chairman	B. Czech
Members:	P. Ammendola
	S. Fernández de Córdoba

Summary of Facts and Submissions

I. This appeal is against the decision of the Opposition Division rejecting the opposition filed against European patent No. 1 250 404.

II. The patent as granted contains seven claims.

Claim 1 as granted (hereinafter **claim 1**) reads:

"*1. A method of controlling injector deposits in a direct injection gasoline engine, said method comprising providing as fuel for the operation of said direct injection engine a fuel composition comprising a Mannich base detergent that is a reaction product of an alkyl-substituted hydroxyaromatic compound, an aldehyde and an amine, wherein the detergent is supplied to the fuel composition in an amount in the range of 38.56 to 231.6 ppm (10 to 60 ptb).*"

The remaining granted claims 2 to 7 define preferred embodiments of the method of claim 1.

III. With its notice of opposition, the Opponent had requested revocation of this patent on the grounds of lack of novelty and lack of inventive step (Article 100(a) EPC).

In particular, the Opponent had raised a novelty objection substantiated by reference to, *inter alia*, documents

D1 = Adibis Technical sales brochure entitled "High Performance Chlorine Free Gasoline Detergent Package ADX 4007" and

D2 = Declaration by Mr Malcom Macduff dated 17 November 2009.

This novelty objection (hereinafter referred to as **the ADX novelty objection**), is based on the assertions
- that document D1 disclosed to the public the use of the additive ADX 4007 in a method for controlling injector deposits in a **d**irect **i**njection **g**asoline **engine** (hereinafter **DIG engine**);
- that the product ADX 4007 referred to in D1 had been made available to the public by sales, and
- that a skilled person had been able to determine the presence and the amount, in said commercialised additive, of a Mannich compound as defined in claim 1 at issue.

As regards the latter aspect (analysability), the notice of opposition contains (page 3, last paragraph) the following statement:

"The components of ADX 4007 could have been identified by, for example, analysis using ESI-MS (electrospray ionisation mass spectrometry) and NMR at the priority date of the opposed patent (numbered paragraph 2 of D2). In particular, at this date, the Mannich derivative ADX 0254 could have been identified and its quantity in the ADX 4007 additive ascertained."

Inventive step objections were raised in the light of, *inter alia*, the combination of

D21 = EP 1 081 209 A1,

taken as the closest prior art, with

D22 = US 5,997,593 A,

and taking also into account

D30 = Declaration by Mr David Arters dated 18 November 2009, comprising comparative experimental data.

IV. In its reply dated 26 May 2010 the Respondent *inter alia* disputed the relevance of the experimental data contained in D30 and provided further details (see section 2.2.1 of the reply, including a Table on page 7) on the experimental comparison whose results were summarized in Table 3 of the patent in suit.

V. In preparation for the oral proceedings before the Opposition Division, the Opponent filed with letter of 2 September 2011, *inter alia*,

D37 = Declaration by Mr David Arters dated 26 August 2011 (with two Annexes),

comprising new experimental data supposed to show that a succinimide additive used according to D21 performed better than an additive according to claim 1.

With letter of 13 September 2011 it filed, *inter alia*,

D45 = Declaration by Mr James Ray dated 13 September 2011 (with five Annexes),

supposed to demonstrate the analysability of ADX 4007.

Declaration D45 comprises an ESI-MS plot whose peak analysis allegedly indicated the presence of a Mannich compound. D45 (paragraphs 9 and 10) also contains the following statements:

"9. The above shows that ADX4007 is a product that

could contain a Mannich detergent with a polyisobutylene group with a number average molecular weight nominally in the range of about 1000.

10. This analysis of the structure of the Mannich product can be confirmed and completed using FTIR spectroscopy which identifies functional groups and 2-D NMR analysis which defines the connectivity of those functional groups..."

VI. At the oral proceedings of 13 October 2011 the Opposition Division decided, *inter alia*, not to admit into the proceedings document D37, but to admit document D45. The Opposition Division concluded that the grounds of opposition invoked did not prejudice maintenance of the patent as granted.

VII. In its decision the Opposition Division indicated, *inter alia*, that the reasons for not admitting D37 were that the Appellant could and should have filed it with the notice of opposition.

The reasons given in the decision for rejecting the ADX novelty objection comprise the following findings:

"3.7.1 The opponent's argumentation was largely based on the declaration of Dr Ray (D45)....
.....

3.7.2 Regarding the ESI-MS plot submitted by the opponent, the opposition division agrees with the patent proprietor that molecular mass alone does not give structural information. ..... even the opponent admitted, both in par.10 of D45 and during oral proceedings, that additional structural

analysis was required to identify the Mannich product.

3.7.3 Regarding this additional structural analysis, the opponent merely mentioned FTIR and 2D-NMR and asserted that the structure of the Mannich product "can be confirmed" (D45 par. 10), without providing any further detail of how FTIR and 2D-NMR analysis would have been performed in practice to ascertain the Mannich structure.

.....

3.7.5 Summarising, the evidence adduced by the opponent is incomplete and does not convince the opposition division beyond reasonable doubt that the person skilled in the art could have ascertained the presence of a Mannich detergent and its concentration in a sample of ADX4007 by analytical methods available before the priority of the patent-in-suit...."

In the assessment of inventive step the Opposition Division (see in particular point 5 of the reasons) considered document D21 as the closest prior art since it disclosed the use of, *inter alia*, polyetheramine (hereinafter **PEA**) as detergent additive for gasoline fuel for DIG engines, in order to control combustion chamber deposits.

The comparative experiments disclosed in the patent in suit (Table 3), further complemented by information provided in section 2.2.1 of the Patent Proprietor's written submission dated 26 May 2010, were found more convincing than those submitted by the Opponent (with

D30). Hence, the former rendered credible that the technical problems solved by claimed method in the light of the closest prior art D21 was the provision of an improved method of controlling of injector deposits in DIG engines. Considering that all other documents, inclusive D22, cited by the Opponent in combination with D21 gave no indication that Mannich bases could be more effective than PEAs in controlling injector deposits, the Opposition Division concluded that the subject-matter of claim 1 involved an inventive step.

VIII. With its statement of grounds of appeal the Appellant (Opponent) filed, *inter alia*, further documents

D48 = Declaration by Mr Kurt Wollenberg dated 22 March 2012 (with four Annexes) concerning the analysability of ADX 4007, and

D49 = Declaration by Mr David Arters dated 25 March 2012 (with one Annex), new comparative data regarding injector deposit control

in support of, respectively, the maintained ADX novelty objection and the maintained inventive step objection based on a combination of D21 with e.g. D22.

IX. In its letter of 14 August 2012 the Respondent contested the admissibility of, *inter alia,* D37, D48 and D49. It rebutted once more, the ADX novelty objection and the inventive step objection based on D21 as the closest prior art. With respect to the ADX 4007 novelty objection it filed further documents including

D50 = Declaration from Mr Henrik Magtengaard dated 1 June 2012 concerning the nature of ADX 4007, and

D55 = Expert Report by Mr Janota from Chemir Analytical Services dated 8 August 2012 (with 8 attachments).

X. Subsequently, both Parties filed further letters and further documents as evidence allegedly supporting some of the arguments presented. As these arguments have no particular bearing on the reasons for the present decision, no further details concerning the nature and contents of these submissions is given here.

XI. At the hearing held before the Board on 25 May 2015 the discussion first focused on the ADX novelty objection.

In this context the Respondent disputed the admissibility of D48. Once the Board decided to admit D48 into the proceedings, the Appellant expressly no longer disputed the admissibility of the D50 and D55, and accordingly, also commented the arguments presented by the Respondent with reference to D50 and D55.

No further novelty objection was raised or maintained.

In the course of the subsequent debate on inventive step the issue of the admissibility of documents D37 and D49 was controversially discussed. The Board decided not to admit D37 and D49, as requested by the Respondent.

The debate then focused on the inventive step objections maintained, all based on D21 as the closest prior art, more particularly in the light of a combination of D21 with D22. The Appellant expressly conceded that the same considerations would apply to the combinations of D21 with any of the other documents cited alternatively to D22.

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

The Respondent requested that the appeal be dismissed.

XIII. The arguments of the Appellant of relevance for the present decision may be summarised as follows.

Admissibility of D37

The late filing of this document containing new experimental data about one month in advance of the oral proceedings before the Opposition Division, had been due to the circumstances surrounding the case. There had been no intentional withholding of information on the side of the Appellant. Moreover, the relevance of the data in D37 had already been acknowledged by the Opposition Division.

Thus, the Opposition Division's decision to refuse the introduction of D37 into the proceedings for the reason that this document could and should have been filed by the Appellant already with the notice of opposition, was erroneous and should be overturned.

Admissibility of D48

Since the beginning of the opposition proceedings (see e.g. the statements in the notice of opposition referred to at III, *supra*, and the statement passage in D45 cited at V, *supra*), the Appellant/Opponent had always argued that taking into account common general knowledge, a skilled person familiar with analytical chemistry techniques and being advised by an expert in gasoline additives, was in a position to identify the analytical procedures/techniques that could be used to

identify and quantify the components of ADX 4007. In particular, these techniques could be a combination of ESI-MS (electrospray ionisation mass spectrometry) with further standard characterization techniques such as NMR (nuclear magnetic resonance) and/or FTIR (fourier transform infrared spectroscopy). As these latter techniques were routinely used in analytical chemistry to confirm the results of mass spectroscopy such as ESI-MS, the Appellant had considered that their suitability for confirming the presence of a Mannich compound in ADX 4007, was self-evident and, thus, had not expected that further details were required. It was only at the oral proceedings before the Opposition Division that the Appellant understood that the Respondent specifically objected to the evidence on ESI-MS adduced (with D45) as requiring additional structural information in order to identify the Mannich product in ADX 4007.

Document D48, therefore, was prepared to demonstrate

- that NMR and/or FTIR methods allowed to complement the results of ESI-MS with univocal structural information and,

- that, therefore, it was possible for the skilled person to identify and quantify the Mannich compound present in ADX 4007.

Accordingly, the filing of document D48 only with the statement of grounds of appeal had not been an abuse of the procedure, but had rather been justified by the preceding discussion during the final stage of the opposition proceedings. Hence, this document had to be admitted into the proceedings.

Admissibility of D49

As to the reasons for which these further experimental data were only filed with the statement of grounds of appeal, the Appellant stated in writing (see letter of 2 October 2013, last sentence in section 3) that D49 had been prepared in view of the decision of the Opposition Division not to admit document D37. However, at the hearing before the Board, it argued, instead, that D49 was filed in reply to the criticisms expressed in the decision under appeal (see point 5.8 of the reasons) as regards the data contained in D30. This justified the filing of these data only at the beginning of the appeal proceedings and, thus, their admission into the proceedings.

Lack of novelty of claim 1

D48 proved that a skilled person was able to determine the chemical composition of ADX 4007 without undue burden and, thus, that the commercial availability of this product amounted to making available to the public the presence and the amount of Mannich base product contained therein, in accordance with the principles established in decision G 1/92 (OJ 1993, 277).

The opposite conclusions of the author of report D55 were possibly indicative of a lack of familiarity of the latter with the field of fuel additives. The failure described in D55 to identify the "polyisobutylene amine" mentioned in D1 should have inevitably prompted the technical expert to also investigate whether the detergent additive present in ADX 4007 possibly belonged to another one of the few classes of detergents conventionally used as fuel additives, such as the Mannich base detergents.

Lack of inventive step of claim 1

The Opposition Division erred in finding (point 5.8 of the reasons) that the experimental comparison disclosed in the patent in suit and the further details thereto given in section 2.2.1 of the submissions of the Respondent dated 26 May 2010, provided an indication of an improved performance of the Mannich base examples over the PEA examples. This was apparent in view of the experimental data contained in documents D37 and D49.

Even if the experimental data in the patent were erroneously considered to demonstrate an improved injector deposit control in some particular cases, they did not render plausible the same advantageous effect across the whole scope of claim 1. This claim allowed for many structures of the polar groups of the Mannich base detergent, including structures that were substantially different from the specific compounds present in the detergents tested according to the examples of the patent.

Thus, the only problem possibly solved by the subject matter of claim 1 in the light of the closest prior art, i.e. the method disclosed in paragraph [0081] of D21, was the provision of an alternative.

Since the use of Mannich base detergents for controlling injector deposits was one of several options suggested, *inter alia*, by D22, the combination of documents D21 and D22 rendered obvious the method of claim 1.

XIV. The arguments of the Respondent of relevance for the present decision may be summarised as follows.

Non-admissibility of D37

The Opposition Division had correctly exercised its discretion in deciding not to admit into the proceedings these extremely late-filed experimental data, because they could and should have been filed much earlier and because their admission would have required to adjourn the oral proceedings (in order to give to the Patent Proprietor the possibility to provide counter evidence). Thus, there was no reason to reverse this decision of the Department of First Instance.

Non-admissibility of D48

Also these experimental data could and should have been filed by the Appellant during the opposition proceedings and, possibly, already with the notice of opposition. In the opinion of the Respondent, it was apparent in the notice of appeal (statement on page 3; see III, *supra*) and from a similar statement in D2, paragraph 4, that the Appellant's line of reasoning relied, *inter alia,* on the allegation that a skilled person could have identified the presence of a Mannich compound in ADX 4007 (and determined its concentration) by using ESI-MS in combination with (at least) NMR. However, the Appellant had waited until the start of the appeal proceedings before completing its case by providing, with D48, information as to how, in its opinion, the NMR technique could have contributed to the identification of a Mannich compound in ADX 4007. This amounted to an intentional withholding of information, i.e. to an abuse of the procedure.

Non-admissibility of D49

This document should not be admitted alone for the reason that, if admitted, it allowed the Appellant to avoid the consequences of the sanction for not having filed D37 in due time during the opposition proceedings.

Admissibility of D50 and D55

These documents were filed in reaction to the filing of D48 with the statement of grounds of appeal. Thus, if this latter citation were to be allowed into the proceedings also 50 and D55 had to be admitted.

Novelty of claim 1

D55 proved that an expert only provided with the information contained in D1 as to the nature of the additive present in ADX 4007, had not been able to determine the presence therein of a Mannich compound. The curriculum vitae enclosed to D55 proved that the scientist that had prepared this report was very competent in the relevant technical areas. For this reason alone, the Appellant's ADX novelty objection manifestly had to fail.

The different results in D48 could reasonably be attributed to the fact that the Appellant's expert, when prepared this report, manifestly knew that the additive present in ADX 4007 was a Mannich base detergent.

Inventive step assessment for claim 1

There was no admissible evidence on file demonstrating

that the method of claim 1 encompassed embodiments producing worse injector deposits control than the closest prior art disclosed in D21.

Nor had the Appellant provided any evidence or convincing argument supporting its allegation that polar groups possibly present in the Mannich compound defined in claim 1 should be expected to provide worse results than those of the specific Mannich products tested (according to the examples of the patent) simply because the former were structurally different from the latter.

Hence, there was no reason for departing from the finding of the Opposition Division that the claimed subject-matter provided an improved deposit control and, that this improvement was not obvious in view of the prior art.

Reasons for the Decision

Procedural issues

1. Non-admittance into the appeal proceedings of D37

Declaration D37 containing experimental data was filed by the Appellant a few weeks in advance of the hearing before the Opposition Division, had not been admitted by the Opposition Division under Article 114(2) EPC for the reasons indicated at points 2.4 and 2.5 of the reasons of the decision under appeal.

1.1 According to the jurisprudence of the Boards of Appeal (see G 7/93, OJ 1994, 775, Reasons, 2.6) a Board of Appeal should only overrule the way in which a first-

instance department has exercised a discretionary power attributed to such department by the EPC, if it comes to the conclusion either that the department in its decision has not exercised its discretion in accordance with the proper principles, or that it has done so in an unreasonable way, and has thus exceeded the proper limits of its discretion.

1.2 For the Board, paragraphs 2.4 and 2.5 of the decision under appeal provide a detailed and logically structured presentation of the facts and arguments that have led the Opposition Division to the conclusion that the experimental comparison (with a succinimide additive) introduced for the first time with document D37 could (as this experimental data were already available to the Opponent at the time of filing the notice of opposition) and should (due to the required long duration of further test runs, if envisaged as counter-evidence by the Proprietor) have been filed earlier and, additionally, that its introduction into the proceedings would have required adjourning the hearing (procedural economy aspect).

The Board was and is thus satisfied that the Department of First Instance has not exercised its discretion in an unreasonable way, or applying wrong principles. Despite the acknowledged potential relevance of the data comprised in D37, the Opposition Division did not, in the Board's judgement, go beyond its discretionary remit.

1.3 Since the Board saw no reason for overruling the discretionary decision of the Opposition Division, it decided not to admit D37 into the proceedings (Article 114(2) EPC and 12(4) RPBA). The contents of D37 are

thus disregarded in the assessment of the patentability of the claimed subject-matter, *infra*.

2. Admittance into the appeal proceedings of D48

This document was filed with the statement of grounds of appeal. It comprises a declaration and experimental data in support of the Appellant's argument (concerning the ADX novelty objection) that NMR analysis allowed a skilled person to identify the presence and the amount of Mannich compounds in the product ADX 4007.

2.1 The Respondent requested non-admittance of D48 because, in its opinion, these experimental data could and should also have been filed by the Appellant during the opposition proceedings and, possibly, already with the notice of opposition (see XIV, *supra*).

2.2 The Board notes, however, that the Appellant's wording in the notice of opposition (see the passage cited in III *supra* also referred to by the Respondent) and the similar statement in paragraph 4 of D2 may imply that, at least in the Appellant's opinion, it was self-evident to the skilled analytical chemist (e.g. on the basis of common general knowledge) that the combination of ESI-MS and NMR could be used to identify the precise nature of the compounds present in ADX 4007. In addition, in all its submissions preceding the oral proceedings before the Opposition Division, including D45 (points 9 and 10) filed one month before the hearing, the Appellant appears to have considered that already the ESI-MS data *per se* indicated the presence of Mannich head-groups, presence to be then merely confirmed by conventional techniques (e.g. NMR or FTIR).

Hence, the Board accepts the Appellant's undisputed argument that it was explicitly confronted for the first time at the first instance oral proceedings with the specific objection that the ESI-MS plot alone did not give structural information and, thus, that additional structural information was required to identify a Mannich compound possibly present.

Finally, the Board takes from point 3.7.2 of the reasons of the decision under appeal (see also VII, *supra*) that this specific objection contributed to the Opposition Division's finding that the ADX novelty objection was not convincing.

2.3 Accordingly, the Board concludes that the filing of D48 with the statement of grounds of appeal was actually a prompt reply to said specific objection only raised at the final stage of the opposition proceedings, rather than an intentional withholding of information. Moreover, it constitutes an attempt to overcome one of the objections which led to the rejection of the opposition.

Hence, the Board, exercising its discretion under Article 114(2) EPC and Article 12(4) RPBA, decided to admit D48 into the proceedings.

3. Non-admittance into the appeal proceedings of D49

3.1 This document contains comparative experimental data and was filed with the statement of grounds of appeal. As to the reasons for its late filing, the Appellant mentioned initially the decision of the Opposition Division not to admit document D37 and later on the criticisms expressed in the decision under appeal as regards the data contained in D30 (see XIII *supra*).

3.2 The Board notes the following:

- Said "criticisms" expressed in the decision under appeal (Reasons, point 5.8) are substantially the same as those already contained in the Respondent's reply to the notice of opposition dated 26 May 2010 (see page 9, section 2.2.2, the last paragraph).

- It is undisputed that the data presented in document D49 relate to an experimental comparison with the same succinimide additive that had been considered in the experimental comparison submitted with D37, which had not been admitted by the Opposition Division, *inter alia,* because could and should had been filed earlier.

The Board concludes, therefore, that the filing of D49 with the statement of grounds of appeal does not represent a timely reaction to some immediately preceding new objection or submission of the adverse Party, e.g. to arguments of which of the Appellant only become aware during the hearing before the Opposition Division and/or upon reading the decision under appeal. Moreover, admittance of D49 would result in re-introducing the experimental comparison with the same succinimide additive considered in D37, thereby allowing the Appellant to circumvent the decision not to admit D37.

3.3 Accordingly, the Board, exercising its discretion under Article 114(2) EPC and Article 12(4) RPBA decided not to admit D49 into the proceedings. The contents of this document are thus also disregarded in the assessment of inventive step, *infra*.

4. Admittance into the appeal proceedings of D50 and D55.

4.1 Documents D50 and D55 were filed by the Respondent with its reply to the statement of grounds of appeal.

4.2 The Board is satisfied that they were filed in timely reaction to the filing of document D48 by the Appellant with the latter's statement of grounds and further corroborate the Respondent's position as regards the analysability of ADX 4007 in a very relevant manner.

The Appellant confirmed at the oral proceedings that considering that D48 was admitted, it no longer objected to the admittance of D50 and D55.

4.3 Hence the Board decided to admit documents D50 and D55 into the proceedings (Article 114(2) EPC and Article 12 RPBA).

Patent as granted (sole Respondent's request)

Novelty

5. The only novelty objection ultimately maintained by the Appellant is the ADX novelty objection.

6. According to decision G 1/92 (Reasons, point 1.4; Conclusion 2) the chemical composition of a product made available to the public is state of the art provided the product can be analysed and reproduced by the skilled person without undue burden.

Hence, this novelty objection implies, *inter alia*, that the skilled person was able to identify at the relevant date, as a component of the chemical composition (undisclosed in D1) of the product ADX 4007, the

presence of a Mannich base detergent and to determine its relative amount without undue burden.

6.1 Contradictory conclusions were offered in this respect by two technical experts who performed, respectively, the analysis described in D48 (filed by the Appellant) and the analysis described in document D55 (submitted by the Respondent). In particular, the author of D55 concluded (page 2, "SUMMARY CONCLUSION") that it was not possible to identify the structure of the additive present in ADX 4007 or to quantify it.

6.2 In this respect, the Board notes the following:

- The only information provided in D1 (see the second full paragraph on the fifth page of D1 entitled "INTRODUCTION") in respect of the nature of the detergent component present in ADX 4007 is the expression "a novel polyisobutylene amine detergent component". This was not disputed. Thus, this document does not even contain an indirect pointer to the possibility that the detergent contained therein could rather belong to the class of Mannich bases.

- It remained undisputed that the quoted expression referring to polyisobutylene amine was intentionally used in D1 (as confirmed e.g. by D50, paragraph 4). Moreover, no reason was invoked for which a skilled person reading D1 could and would have considered implausible the presence of "a novel polyisobutylene amine detergent component" in ADX 4007.

- D48 was prepared by an employee of the Appellant manifestly aware of the possible presence of a

Mannich compound in ADX 4007, as apparent e.g. from his statement in D48, point 8, reading "I am familiar with the opposition which has been filed by Lubrizol Limited against European Patent 1250404 B1."

- Instead, report D55 was prepared by an expert working for an independent third party analytical laboratory that had only been provided with a sample of ADX 4007, with the Material Safety Data Sheet of this product and with D1 (see the section entitled "SUMMARY OF PROJECT GOALS" on page 3 of D55).

- From the curriculum vitae enclosed as Annex 1 to D55, it can be gathered that the scientist who performed the analysis described in D55 has expertise in, *inter alia*, the analysis of commercial fuel samples and in the analysis and quantitation of unknown components (see section "Experience", including "Deformulation experience"). For the Board, the Appellant's allegation to the contrary (i.e. that the findings in D55 were possibly due to a lack of familiarity of the author of this report with the technical field of fuel additives), not further supported by evidence, is thus not convincing.

6.3 Taking the above into account, the Board concludes that a skilled person reading D1 has no reason to doubt the veracity of statement in this document indicating the presence of a "polyisobutylene amine component", let alone to expect that this component could, instead, be a Mannich base detergent.

6.4 The Board holds, therefore, that the two expert reports D48 and D55 are of different probative value. More particularly, for the Board, D55 is a much more realistic and, hence, more convincing reproduction of what the skilled person, aware only of the technical information provided by D1 as regards ADX 4007 (but not of the content of the latter in a Mannich type detergent), could actually be expected to do in order to identify and quantify, without undue burden, the detergent component(s) contained in the allegedly commercialised product ADX 4007.

7. Accordingly, in the Board's judgement, the person skilled in the art was not able to determine the true composition of such a product without undue burden and, thus, could not neither identify the presence of a Mannich base detergent therein nor quantify its relative amount.

For this reason, the Board rejects the ADX novelty objection of the Appellant.

8. The Board thus concludes that the subject-matter of claim 1 as granted and, consequently, the subject-matters of claims 2 to 7 dependent thereon, meet the requirement of novelty (Articles 52(1)and 54(1),(2) EPC).

Inventive step

9. The invention

The invention concerns a method of controlling injector deposits in DIG engines by providing as fuel a composition containing a detergent additive.

10. The closest prior art

10.1 For the Board, the closest prior art is represented by document D21. It was also common ground between the Parties that D21 was the appropriate starting point for the assessment of inventive step.

10.2 In particular, D21 (paragraph [0081]) discloses the addition of detergent additives such as succinic acid amide, polyalkyl amine and PEA, to an unleaded gasoline for DIG engines in order to prevent combustion chamber deposition.

11. The technical problem

11.1.1 According to the patent in suit (see e.g. the conclusions in paragraph [0058] based on the data in Table 3 of the patent in suit) the claimed method provides superior performance in controlling DIG injector deposits compared to other classes of gasoline detergents, such as PEAs.

11.1.2 Hence, the Respondent submitted that the technical problem solved by the claimed method in the light of the closest prior art D21 (paragraph [0081] consisted in providing of an improved method of controlling injector deposits in DIG engines.

12. The solution

The patent in suit proposes to solve this problem by providing the method of controlling injector deposits in a DIG engine according to claim 1, which is characterised by "*providing as fuel for the operation of said direct injection engine a fuel composition comprising a* **Mannich base detergent** *that is a* **reaction**

product of an alkyl-substituted hydroxyaromatic *compound, an* **aldehyde and** *an* **amine**, *wherein the detergent is supplied to the fuel composition* **in an amount in the range of 38.56 to 231.6 ppm** *(10 to 60 ptb)*" (emphasis added by the Board).

13. Success of the solution

13.1 The Appellant disputed the findings in the decision under appeal (point 5.8 of the reasons summarised at VII, *supra*) that the method of claim 1 provided superior control of injector deposits in comparison to the use of PEA-based additives.

13.1.1 However, to support this objection the Appellant only relied on experimental data contained in late-filed documents that have not been admitted into the proceedings (D37, D49).

13.1.2 Therefore, the Board sees no reason for calling into question that the method according to claim 1 effectively solves the posed technical problem and, thus, has no reason to depart from the finding of the Opposition Division in this respect.

13.2 The Appellant additionally argued that the experimental data in the patent in suit were too limited to prove the achievement of an improved level of control of injector deposits across the whole scope of claim 1 (see XIII, *supra*).

13.2.1 The Board notes, however, that this argument has not been unsupported by any evidence or detailed reasoning, e.g. as to why and/or which polar end groups of the Mannich base detergent embraced by the definition in claim 1 at issue could be expected to be less effective

in controlling deposits than those tested in the comparative experiments of Table 3 of the patent in suit. In the Board's judgement, to simply stress that a plurality of Mannich compounds with diverse structures is embraced by the definition of the Mannich base detergent in claim 1, is not *per se* sufficient to render plausible that some of them should produce significantly worse results than the compounds used in the examples of the patent.

13.2.2 Hence, the Board sees no convincing element on the basis of which it could be concluded that the level of anti-deposit benefits proved by the comparative examples in the patent in suit does not occur across the whole scope of claim 1 at issue.

13.3 Therefore, the Board is satisfied that the method according to claim 1 at issue effectively solves the technical problem posed.

14. Non-obviousness of the solution

It remains to be assessed whether the claim solution was obvious to the skilled person with regard to the state of the art.

14.1 The inventive step attack of the Appellant is entirely based on the allegation that the claimed subject-matter does not solve the posed technical problem, i.e. does not provide any improvement in terms of injector deposits. Accordingly, the Appellant presented no arguments, let alone arguments supported by evidence, that could lead to the conclusion that a skilled person could expect injector deposit control benefits when replacing the PEA additives of the closest prior art by

a Mannich base detergent as defined in claim 1 at issue.

14.2 Neither does the Board see in the prior art relied upon by the Appellant, including D22, any element permitting to conclude that the skilled person seeking to solve the technical problem posed would obviously consider replacing the PEA additives used according to the closest prior art D21 by a such a Mannich base detergent in the expectation of further reduced injection deposits.

14.3 Therefore, in the Board's judgement, the subject matter of claim 1 as granted involves an inventive step (Articles 52(1) and 56 EPC).

15. Since the dependent granted claims 2 to 7 define preferred embodiments of the inventive method of claim 1, their subject-matter also involves an inventive step.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

D. Magliano B. Czech

Decision electronically authenticated