

## Examiners' Report Paper B 2008 (Chemistry)

The paper concerns grease compositions comprising a lubricating base oil, a grease thickener and combination of additives. The application defined grease compositions, method of making the greases and constant velocity joints (CVJ) filled with the grease indicating this as the use.

The application covered grease compositions comprising different possible thickeners (lithium soap, complex soap and diurea based thickener) in combination with additives, notably metal salts of dialkyl dithiophosphoric acid (DTP) and dialkyl dithiocarbamic acid (DTC) and their mixtures. Suitable salts included zinc and molybdenum salts (ZnDTP, MoDTP, ZnDTC and MoDTC). The composition optionally also contained an ashless anti-wear additive such as triphenyl phosphate (TPP). The application indicated that it is preferable to use two different metal-containing additives in order to sufficiently reduce friction, wear, noise and vibrations. The choice of lubricating base oil was not indicated to be important and it only needed to be present in the composition. The application contains data for all the different thickeners in combination with two metal salts and also with added TPP. The data in the application can be compared with the data in D2 as the methods of testing are the same.

Both D1 (Annex 1) and D2 (Annex 2) are novelty destroying for claims of the application and both concern greases.

D1 discloses greases for Swiss watches comprising preferably a diurea thickener and as additives ZnDTP and TPP. D1 also discloses the method for the diurea thickener preparation.

D2 discloses greases for CVJ comprising lithium soap or lithium complex soap as thickener and antiwear additives selected from metal dialkyl dithiophosphates and metal dialkyl dithiocarbamates, represented by ZnDTP and MoDTC. D2 also discloses the preparation of the lithium greases. The additives are said to reduce friction and wear and the results are demonstrated in a table. Although no examples or results are presented for the combination of two metal salt additives, such a combination is suggested in D2 (last lines of the description).

D2 is the closest prior art, as it concerns the same use.

D1 does not disclose the same use, it nevertheless concerns lubrication with very similar grease compositions and should not to be considered as an accidental anticipation for the grease composition ("so unrelated to and remote from the claimed invention that the person skilled in the art would never have taken it into consideration when making the invention" G1/03 and G2/02).

## Claims

A high number of candidates seemed to have problems with drafting allowable claims.

The candidates were expected to amend the claim to the grease composition. Up to **25 marks** were available for such a claim.

In order to overcome the novelty objections with respect to document D1, it was possible to claim a grease composition comprising the combination or mixture of the **two** metal containing additives. Since document D2 already suggests the combination of two metal containing additives in greases, it was also necessary to further restrict the claim. One appropriate amendment was to limit the grease **thickener** to the diurea thickeners that are not disclosed in D2.

In addition to this claim, there were other possible claims.

Grease composition comprising lubricating base oil, a diurea thickener and at least one oil soluble metal salt of dialkyl dithiocarbamate.

D1 does not disclose the metal salt of DTC and D2 fails to disclose the diurea thickener.

Grease composition comprising a lubricating base oil, any thickener and as additives the combination (or a mixture) of two oil soluble metal salts of dialkyl dithiophosphate and dialkyl dithiocarbamate and an ash-free additive/TPP.

D1 does not disclose a combination of two metal containing additives and D2 fails to disclose the combination of two metal containing additives and an ashless anti-wear additive.

These two types of claims could also attract full marks.

Some candidates drafted claims which were considered only formally novel due to the lack of the indication in the prior art that the additives should be oil soluble.

These claims could attract **5 marks** in total.

A significant number of candidates have drafted claims that are not novel over the prior art, or they used one or several disclaimers to render the subject-matter novel. Such candidates would generally lose all the marks for the composition.

Candidates who drafted claims with added subject-matter had lost at least **10 marks**.

Candidates who limited the claims unnecessarily, for example, to specific oils, specific thickeners, specific metal salts/metals or specific amounts had up to **5 marks** reduced for each such limitation. Failure to indicate the oil-solubility of the additives leads to a similar reduction. A limitation to the preferred oil soluble C8-18 atoms alkyl group, or an indication of specific use also led to a minor reduction, as well as drafting claims with clarity problems (**between 2 and 5 marks**).

A further novel and useful embodiment is a constant velocity joint filled with a grease composition comprising diurea thickener and at least one of the metal salts. A corresponding use claim could alternatively be drafted. D1 fails to disclose the use of C and D2 fails to disclose a diurea thickener. It was thus possible to incorporate a grease not having all the features of the grease composition in the joint.

The claim could read as follows:

A constant velocity joint filled with a grease composition comprising lubricating base oil, a diurea thickener and an additive selected from oil soluble metal salts of dialkyl dithiophosphoric acid and dialkyl dithiocarbamic acid, or

Use of a grease composition comprising lubricating base oil, a diurea thickener and an additive selected from oil soluble metal salts of dialkyl dithiophosphoric acid and dialkyl dithiocarbamic acid in a constant velocity joint.

Such claim formulation was worth up to **17 marks**. Candidates who did not realise that it was possible to define the grease present in the CVJ more broadly than the grease in the claim directed to the grease composition normally only received **3 marks**.

A further useful claim is the method for the preparation of the grease, which in total could attract up to **3 marks**. The method claim had to be consistent with the grease composition claim to receive these marks.

As usual, candidates drafting two or more independent claims on the same subject (grease composition, CVJ, etc) only received marks for one of those claims, namely the one attracting the least marks. In addition, if the candidate received any marks at all, some marks could be deducted in case of violation of Rule 43 EPC.

Dependent claims including maintaining some of the original claims were worth up to **5 marks**.

Divisional applications were not expected, but a separate indication of filing useful subject-matter (formulated as a claim and with indicated arguments) attracted marks, if these did not create contradictions and were not based on wrong arguments. Proposals for unnecessary divisional applications did not attract the full number of marks that would have been awarded if the claims had been part of the proposed set of claims in the original application. Unnecessary divisional applications are (of course) not to the advantage of an applicant.

*Note: in the French version of the claims of the originally filed application, there was missing in claim 5, part a), last line the words "dans une huile lubrifiante de base" between the words "cycloalkylamine" and "pour". During the marking this deficiency was taken into account and no candidate has been disadvantaged.*

A total of **50 marks** were available for the claims.

## Arguments

It was noticeable that the argumentation was better than in previous years.

The candidates were expected to indicate the basis for the amended claims as well as new combinations of features in these claims. Also they were expected to indicate that the clarity problem has been overcome. They were merited with up to **11 marks** for these formal matters.

As regards novelty, the candidates were expected to briefly summarise the prior art documents (**6 marks**) and to highlight the distinguishing feature(s) over the prior art (**10 marks**). Thus for the novelty analysis **16 marks** in total were available.

*Example of a summary:*

*D1 discloses grease compositions for wrist-watches comprising lithium/lithium complex/diurea thickener in combination with ZnDTP and an ashless antiwear additive (TPP). D2 discloses grease compositions for constant velocity joint (CVJ) comprising lithium/lithium complex thickener and as antiwear additives one or more metal salts (ZnDTP, MoDTC).*

If the candidate only stated that D1/D2 does not disclose the differing feature, without comparing the relevant disclosure of the prior art and the application, substantially fewer marks were awarded.

The arguments for inventive step were worth up to **23 marks**.

Inventive step in the present case is based on the effects shown in the application, notably reduction of noise and vibrations (or some cases reduction of friction and wear) in constant velocity joints (see the table in the application). The problem of noise and vibration is clearly associated with the specific use and is solved by combination of the additives and the diurea thickener.

To obtain a maximum number of marks, the problem-solution-approach should be used. The first step would be the selection of the closest prior art and the indication of the difference(s) which gave up to **4 marks**.

D2 is to be considered as the closest prior art since it concerns the same application (CVJ). Candidates were expected to provide arguments as to why D2 is the closest prior art and depending on the type of the claim, the differing feature(s) should be indicated.

Further defining the problem solved in view of the closest prior art and a short discussion of the evidence showing that the problem has been solved belongs to the problem-solution approach and for this step the candidates could in total get up to **8 marks**.

Irrespective of the type of claim drafted, the candidates were expected to provide arguments that were in line with their claims.

If the candidate had drafted a claim directed to diurea thickened compositions, for there is a **new effect** shown in the examples, notably **reduction of noise and vibrations**. When comparing examples 5 to 7 with examples 1-4 of Annex 1, the problem lies in the reduction of noise and vibrations and the same data shows that the problem has been solved.

As regards other types of claims, the argument about reduced noise and vibrations was not available. The only valid effect is a reduction in friction and wear, which is seen when comparing examples 5 and 7 (Annex 1, page 6). The problem to be solved is to be seen in further improving the compositions of D2.

The claims deriving their novelty from oil-solubility only, require special arguments. Candidates relying on such claims normally failed to provide convincing arguments about the effects of oil solubility, because the prior art uses substantially the same additives. There is also no support in the application for a problem solved that would be associated with this feature.

The last step in the problem-solution concerns obviousness for which up to **11 marks** were awarded. Again, depending on the claim type, the candidates who drafted claims with diurea thickener and metal containing antiwear additives were able to argue that D2, which is the closest prior, art is silent of the problems of noise and vibration, which are improved more for the diurea greases than known lithium greases. For the other type, D2 does not suggest the use of an ashless anti-wear additive in addition to metal additives. In this case it was expected that the candidates stress that the mention of the ashless anti-wear additive TPP is in a comparative example with poor results. It was not obvious to expect any significant reduction in wear and friction by the addition of TPP, since D2 shows always a higher friction coefficient and wear scar for TPP than for the metal additive containing compositions.

Also, for all types of claims the candidates were expected to argue that D1 and D2 would not be combined.

For the arguments **50 marks** were available.

# EXAMINATION COMMITTEE I

Candidate No. \_\_\_\_\_

## Paper B (Chemistry) 2008 - Schedule of marks

Category	Maximum possible	Marks awarded	
		Marker	Marker
Grease composition	25		
Constant velocity joint	17		
Method claim	3		
Dependent claims	5		
<b>Claims</b>	<b>50</b>		
Amendments	11		
Novelty	16		
Inventive Step	23		
<b>Arguments</b>	<b>50</b>		
<b>Total</b>	<b>100</b>		

Sub-Committee for Chemistry agrees on ..... marks and recommends the following grade to the Examination Board:

PASS  
(50-100)

FAIL  
(0-49)  
COMPENSABLE FAIL  
(45-49, in case the candidate sits  
the examination for the first time)

4 July 2008

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Chairman of Examination Committee I