

Examiners' Report Mock Paper B

1. Introduction

The purpose of this mock paper is to provide an example of an EQE paper B which is deemed to be suitable for candidates from all technical fields. Importantly, this mock paper is for training purposes only and is only illustrative of the type of the future EQE papers. It cannot be used as a reference or baseline against which future papers could be judged.

This mock paper is based on the C-paper of 2013. Although it has been prepared with the same care and using almost the same processes than for “normal” EQE paper, it might still comprise a few inconsistencies.

Furthermore, it is to be understood that the present examiner report is purely artificial and can only represent the imperfect view of the (enlarged) drafting sub-committee involved in its preparation. For a real paper, there is a second stage which starts with the analysis by the markers of the hundreds of responses provided by the candidates. Not only the most frequent mistakes are identified during such an analysis, the best solutions are also often found in the candidates' responses! A real-life Examiner's report would hence be adapted and corrected in view of the candidates' responses.

The paper relates to airbag modules consisting of a control unit, a gas generator and an inflatable fabric cushion. In a situation of impact, the control unit activates the gas generator, which delivers a quantity of gas that fills the cushion to a certain pressure within milliseconds. The application explains that during major impacts when the occupant of a vehicle is projected against the airbag, the pressure in said airbag may rise to such an extent that the cushion becomes so hard that it can cause injuries to the occupant. As a solution to this problem, the original application proposed the inclusion of a pressure-regulating valve into the fabric cushion. This pressure regulating valve can be in the form of an elastic membrane at least partially covering a vent-hole provided in the fabric cushion of the airbag, the membrane being attached to the cushion by means of a rubber-based adhesive. In addition, the original application proposes, in a dependent claim, two different gas-generating compositions.

1.1. The prior art

Two documents are cited by the Examining Division against the application.

Document D1 discloses an airbag module for protecting a vehicle occupant in a collision. The airbag of D1 comprise a control unit, a gas generator comprising a housing and a fabric cushion comprising a pressure regulating valve. D1 mentions in paragraph [0007] that the pressure regulating valve can be made of an elastic membrane at least partially covering the vent-hole and attached to the cushion by means of a rubber-based adhesive. In paragraph [0008], D1 mentions pyrotechnical powder compositions, i.e. gas-generating composition, but does not disclose their exact nature.

Document D1 is hence novelty-destroying for original claims 1 and 2 of the application.

Document D2 investigates pyrotechnical gas-generating systems for airbags and discloses a large variety of different combinations in the form of a table. In paragraph [0005], D2 specifically discloses the combination of guanidine borate, ammonium perchlorate and sodium nitrate.

The combination of the teachings of D1 and D2, both relating to airbags and gas-generating compositions to be used to inflate airbags, renders the subject-matter of claim 3 of the application obvious.

1.2. The communication

Novelty objections are raised by the Examining Division in the communication against claims 1 and 2 on the basis of document D1.

The Examining Division also raises an objection of lack of inventive step against the subject-matter of dependent claim 3 in view of the combined teachings of D1 and D2.

Finally, the Examining Division objects to dependent claim 3 as being unclear because the claim comprises a method step in a claim relating to a product.

1.3. The letter from the applicant

The client proposes a set of claims addressing the objections raised by the examiner. In this set of claims, claim 1 is limited to the subject-matter of original claim 1 combined with the subject-matter of original claim 3, with the further restriction that the composition has to have a weight ratio of guanidine borate to ammonium perchlorate between 2:1 and 5:1, which range is not specifically disclosed in the prior art documents.

The client also deleted former claim 2, the reason being that he believes that the airbag modules falling within this dependent claim will soon be forbidden.

In addition, the client hints that a dependent claim could be reinstated and/or added if deemed useful.

The client also explains that recent internal results have shown that the weight ratio of 3:1 of guanidine borate to ammonium perchlorate produces a surprisingly clean combustion, i.e. free of toxic residual gas. Consequently, a new dependent claim has been added by the client in the proposed set of claims to specifically cover this embodiment.

The client explains that the competitors are using polyamide resin-coated fabrics and that he added a claim to cover this embodiment. The client further explains that he would also like to have a claim covering an airbag module comprising an uncoated fabric cushion and invites the patent attorney to draft a dependent claim covering this embodiment.

Since he does not understand the objection, the client leaves it to the attorney to deal with the objection of lack of clarity.

Last but not least, the client clearly indicates that he is only interested in claims to airbag modules.

1.4. The expected claims

Some of the amendments proposed by the client add subject-matter, contrary to Article 123(2) EPC.

The airbags described in the original application always comprise a valve (see also first sentence of [0009]). Deleting the pressure regulating valve introduces a new embodiment (airbags without valves) which was not explicitly disclosed in the original application. In addition, paragraph [0002] clearly stipulates that it is essential to have a pressure regulating valve when large amounts of gas are generated gas-generating compositions. Since the gas-generating compositions claimed do generate large amount of gas ([0013]), the presence of a valve is an essential feature and cannot be deleted. Therefore, the deletion of the pressure regulating valve as performed by the client contravenes with the requirements of Article 123(2) EPC.

Although, the original application specifically refers to the ranges 1:1-10:1 and 2:1-5:1 ([0015]), the original application does not explicitly refer to the specific ratio 3:1. There is hence no basis in the original application for the 3:1 ratio defined in new claim 2.

In addition, the weight ratio 2:1-5:1 has only a clear and unambiguous basis in the original application ([0015]) in combination with the presence of potassium sulfate. Therefore, the addition by the client of this feature into the claim he proposes, i.e. a claim which also comprises sodium nitrate as an alternative to potassium sulfate, adds subject-matter extending beyond the content of the application as originally filed.

Furthermore, the technical effect relating to the speed at which gas is generated is only observed with potassium sulphate, but not with sodium nitrate ([0015]). Since D2 specifically discloses gas-generating compositions comprising guanidine borate, ammonium perchlorate and sodium nitrate, at a weight ratio of 1:1 and 6:1 for guanidine borate and ammonium perchlorate, the conditions for novelty explained in the Guidelines G-VI.8.(ii) are not fulfilled for compositions comprising guanidine borate, ammonium perchlorate and sodium nitrate. In the absence of a technical effect, these compositions are an arbitrary specimen of the prior art (G-VI.8.(ii)(c)).

Therefore, the independent claim proposed by the client adds subject-matter extending beyond the content of the application as filed, and is not novel in the sense of Article 54 EPC.

In order to render this claim novel, the subject-matter of the claim has to be limited to airbag modules using a composition comprising guanidine borate, ammonium perchlorate and potassium sulphate. This can be simply done by deleting sodium nitrate from the claim.

Whereas this deletion of sodium nitrate renders the subject-matter of independent claim 1 novel, the candidates were expected to realise that the further restriction to a particular range is not necessary any more to achieve novelty and inventive step.

This is especially true in view of the two technical effects associated with potassium sulphate. Not only does the addition of potassium sulphate lead to a fast gas generation ([0015]), it also prevents the formation of flames ([0014]) at all the ranges tested by the applicant.

Therefore, the limitation to a particular range might allow the competition to freely produce flameless airbags using other guanidine borate to ammonium perchlorate weight ranges.

The objection of lack of clarity can be easily circumvented by replacing “a gas is generated by a composition” by “gas-generating composition”.

Since it is necessary to remove the 3:1 ratio added by the client, replacing this weight ratio with the 2:1 to 5:1 ratio, which is proposed by the client and was originally disclosed, is considered to be logical. Such a claim, which is clearly linked to a further, beneficial, effect, is an excellent fall-back position. This is especially true in view of the explicit request from the client regarding a new dependent claim.

With regard to dependent claims, another explicit request from the client is a dependent claim encompassing an airbag module having a cushion made of uncoated fabric.

Although the client does not explicitly explain why he wants such a claim (“we are actively considering the use of fabrics without coating”), it should be clear at this stage that this is due to the prevention of flames by the additive potassium sulphate.

Whether the original application provides a clear and unambiguous basis for such a claim is arguable. Paragraph [0011], which refers to uncoated fabrics, does not unambiguously

refer to the fabric of the cushion used in the airbag modules, but rather to fabrics in general. Moreover, paragraph [0014] says that “coating is no longer required” but does arguably not directly and unambiguously disclose uncoated fabrics.

Therefore, the addition of dependent claim to airbag modules wherein the fabric cushion is uncoated, required a good argumentation as to why this claim did not add subject-matter extending beyond the content of the application as filed.

Another possibility was to realise that present independent claim 1 does not require the fabric to be coated. Therefore, the addition of a dependent claim based on [0011] and further defining the fabric as being made of polyester is thought to be an elegant solution. This claim followed by the dependent claim proposed by the client and relating to coated fabrics makes it evident that the fabric does not need to be coated. Moreover, the addition of this claim, which has a clear basis in the original application, only requires a straightforward argumentation with regard to added subject-matter.

Finally, since the valve had to be reintroduced in the independent claim, there is no reason to delete the subject-matter of original dependent claim 2. This is particularly true when the pyrotechnical composition does not produce a flame and the adverse reaction of rubber-based adhesive to flames described in D2.

1.5 The expected arguments

Added subject-matter

Claim 1 has been amended by limiting its scope to one of the two embodiments originally disclosed in former dependent claim 3. Potassium sulphate has always been one of the two preferred embodiments for the additives to be used in the invention, see e.g. original claim 3 of the application as filed. In addition, it has also been singled out in paragraphs [0014] and [0015] of the original application. Thus, restricting the scope of the claims to this particular additive does not introduce subject-matter extending beyond the content of the application as filed.

Paragraph [0015] of the application as filed clearly discloses the weight ratio of guanidine borate to ammonium perchlorate between 2:1 and 5:1 in the presence of potassium

sulfate. The subject-matter of new dependent claim 2 does hence not add subject-matter extending beyond the content of the application as filed.

Basis in the sense of Article 123(2) EPC for the subject-matter of new dependent claim 3 can be found in paragraph [0011] of the original application. This passage explicitly states that the fabric of the cushion can be made of polyester. Since the original claims always referred to a fabric cushion, introducing from the original description further features relating to said cushion does not add subject-matter contravening to the requirements of Article 123(2) EPC.

Paragraph [0011] of the original application also discloses that the fabric, which can be made of polyester, can be coated. Therefore, a clear and unambiguous basis in the sense of Article 123(2) EPC for the subject-matter of claim 4 can also be found in paragraph [0011] of the application as originally filed.

The subject-matter of new dependent claim 5 corresponds to the subject-matter of original dependent claim 2. Since, original claim 3 also depended from original dependent claim 2, maintaining this claim for a new independent claim which has been limited to the subject-matter of original dependent claim 3 does not add subject-matter extending beyond the scope of the application as originally filed. Dependent claim 5 hence also meets the requirements of Article 123(2) EPC.

Clarity

The objection of lack of clarity has been circumvented by replacing “a gas is generated by a composition” by “gas-generating composition”. Since the amended claim does not comprise a method step anymore, the objection of lack of clarity (Article 84 EPC) presented in the Communication under Article 94(3) EPC is considered to be moot.

Novelty

D1 discloses an airbag module for protecting a vehicle occupant in a collision. The airbag of D1 comprises a control unit, a gas generator comprising a housing and a fabric cushion comprising a pressure regulating valve. In paragraph [0008], D1 mentions pyrotechnical powder compositions, i.e. gas-generating composition, but does not disclose their exact nature.

The subject-matter of independent claim 1, which requires a gas-generating composition comprising guanidine borate, ammonium perchlorate, and potassium sulfate is therefore novel over the disclosures of D1.

D2 investigates pyrotechnical gas-generating systems for airbags and discloses a large variety of different combinations in the form of a table. In paragraph [0006], D2 generally refers to the use of sulphates as additives, but does not explicitly refer to potassium sulphate, which is a specific member of the family of sulphates (see [0014] of the original application).

D2 does therefore not disclose a gas-generating composition comprising guanidine borate, ammonium perchlorate, and potassium sulfate, so that the subject-matter of independent claim 1 is novel over the disclosures of this document.

Since claims 2 to 5 are dependent on a novel claim, their subject-matter is by definition also novel.

Inventive step

D1 and D2 both relate airbags. D1 however explicitly relates to airbag modules comprising pyrotechnical powder compositions, whereas D2 only relates to pyrotechnical powder compositions used in airbag modules. Since independent claim 1 relates to an airbag module, and not to a pyrotechnical powder, D1 is considered to be the closest prior art document.

The subject-matter of independent claim 1 differs from the disclosure of D1 in that a specific pyrotechnical powder composition, i.e. a gas-generating composition comprising

guanidine borate as a fuel agent, ammonium perchlorate as an oxidizer, and potassium sulphate as an additive. The effect due to this difference is that no flame is produced during the generation of the gas filling the fabric cushion in a collision ([0014]). The lack of flame allows a greater flexibility in the choice of the fabric of the cushion, e.g. no coating required. The lack of flames also allows the use of the rubber-based adhesive.

The technical problem to be solved can hence be seen in the provision of an airbag module comprising a gas-generating composition which does not produce a flame.

The solution to the problem is a pyrotechnical powder composition comprising guanidine borate, ammonium perchlorate, and potassium sulphate.

As explained in paragraph [0014] of the original application, the composition as claimed does not produce flames, while generating enough gas to fill the fabric cushion of the airbag.

Since D1 does not propose any specific pyrotechnical powder composition, the skilled person would not have been able to solve the above problem using this document alone. The skilled person would have hence turned to a combination of D1 and D2, D2 being a document which specifically discloses pyrotechnical powder composition suitable for use in airbag modules, to attempt solve this problem.

D2, which discloses a large variety of different gas-generating compositions does not teach pyrotechnical compositions which do not produce flames. On the contrary, D2 teaches that flames are advantageous [0007] and therefore teaches away from flameless gas-generating compositions.

Moreover, even if the skilled person would have considered all the combinations disclosed, or fairly suggested, in D2 as straightforward gas-generating compositions to be used in airbag modules, he would not have obtained a gas-generating composition comprising guanidine borate, ammonium perchlorate, and potassium sulphate. The suggestion of D2 of using sulphates does not amount to a suggestion of using potassium sulphate, which is a specific member of the sulphate family.

It is therefore concluded that the subject-matter of independent claim 1 is inventive in the sense of Article 56 EPC over the teachings of D1, taken either alone or in combination with D2.

Since claims 2 to 5 are dependent on an inventive claim, their subject-matter is by definition also inventive.

2. Expected claims

An example of a suitable wording for the amended claims could be obtained by amending the claims suggested by the client as follows:

1. An airbag module for protecting a vehicle occupant in a frontal collision comprising:

- a control unit;

- a gas generator (1) comprising a housing (20) and a gas-generating composition generating gases upon ignition; and

- a fabric cushion (2) comprising a pressure regulating valve (3),

characterised in that

~~a the gas-generating is generated by a composition comprising guanidine borate, ammonium perchlorate, and either sodium nitrate or potassium sulfate is present inside the housing (20), and in that said composition comprises a weight ratio of guanidine borate to ammonium perchlorate between 2:1 and 5:1.~~

2. The airbag module according to claim 1, wherein the gas-generating composition comprises a weight ratio of guanidine borate to ammonium perchlorate ~~of 3:1~~ between 2:1 and 5:1.

3. The airbag module according to any of claims 1-2, wherein the fabric cushion (2) is made of polyester.

~~54.~~ 4. The airbag module according to any of claims 1-~~32~~ 3, wherein the fabric cushion (2) is made of polyester coated with a polyamide resin.

5. The airbag module according to claims 1-4 wherein the valve (3) comprises: an elastic membrane (10) at least partially covering a vent-hole (5) provided in the fabric cushion (2), the membrane (10) being attached to the cushion (2) by means of a rubber-based adhesive (9).

The marking scheme

The claims and the arguments are assessed separately. Therefore candidates who have provided very good arguments for the claims they have submitted can receive good marks for argumentation even if the claims receive few marks. However, it is to be noted that it is easier to argue novelty and inventive step for claims having a restricted scope as compared to the broadest possible claims. Therefore, novelty and inventive step argumentations based on claim features which were not necessary cannot attract full marks.

It is not possible to award negative marks in any section of the marking sheet. Therefore if more marks need to be deducted under a heading than there are marks available 0 marks are awarded.

No marks are available for formulating a letter to the client setting out the reasons why the client's suggested claims were further amended.

No marks are available for any additional independent claims or for any further dependent claims. However, should one or more additional claim have been formulated, a full basis needs to be provided for all the claims, in the absence of which marks were lost.

Similarly, if additional independent claims are submitted novelty and inventive step arguments for these claims are expected and up to half of the available marks available under a certain heading can be reserved for these additional independent claims.

3. Claim amendments

A total of 30 marks is available for the amended set of claims. No marks are available or are deducted for claims other than those listed above.

No marks are available for claims which are not novel.

3.1 The independent claim

The expected independent claim 1 is worth 15 marks.

5 marks are deducted for any unnecessary limitation, such as leaving the weight ratio introduced by the client.

3.2 The dependent claims

Replacing the 3:1 ratio added by the client with the 2:1 to 5:1 ratio is worth 5 points.

Adding features of dependent claims 3 and 5, directed to embodiments highly relevant in the context of gas-generating compositions which do not produce a flame is worth 5 marks for each claim.

4. Arguments

A total of 70 marks is available for the arguments. The arguments are assessed on the basis of the actual set of claims submitted. Thus for example if additional claims are formulated a full basis needs to be provided for all the claims. If additional independent claims are submitted novelty and inventive step arguments for these claims are expected.

4.1. Basis for the amendments (15 marks)

A full basis has to be provided for all of the amendments. In order to obtain full marks it is necessary to identify all the amendments made in the set of claims to be filed as compared

to the original set of claims. The basis needs to be provided irrespective of whether the amendment was proposed in the client's letter or is a further amendment to the set of claims proposed by the client. Amendments proposed by the client but not in the set of claims submitted should not be discussed.

In addition the passages in the original application which form the basis for the amendments need to be identified. If only a series of paragraph numbers are cited a maximum of 5 marks are awarded. No marks are available for referring to the client's letter or to the set of claims proposed by the client as the basis for the amendments.

Arguments need to be provided if features have been combined from different parts of the application. Similarly, if the wording used in the application is modified, if a feature is taken from an example or if features are deleted from a claim, detailed arguments will need to be provided in support of these amendments.

A set of arguments for claims which contain added subject-matter and therefore an incorrect argument for an amendment can be awarded a maximum of 6 marks. A maximum of 10 marks may be awarded for arguments with an incorrect basis (for example by referring to the wrong paragraph).

4.2 Novelty (15 Marks)

The novelty of the claims has to be discussed. Marks are awarded for providing a technical analysis of the prior art, identifying all the differences between the prior art and the subject-matter of the claims filed.

6 Marks are reserved for summarising the prior art documents D1 and D2. The summary should mention all the features of these documents that are relevant for the discussion of novelty and could be worded as in paragraph 1.1 above.

Arguing that the claimed subject-matter is novel with respect to document D1 is worth 3 marks.

The arguments for novelty with respect to document D2 are worth up to 6 marks.

If an additional independent claim is formulated then 8 of the available marks are reserved for discussing the novelty of this claim.

4.3 Inventive step (40 marks)

The inventive step of the proposed set of claims has to be argued using the problem-solution approach.

The first step is to identify the closest state of the art (8 marks).

The difference or differences have then to be identified (2 marks), the technical effects associated with the differences and the evidence for the effects should be identified (5 marks) and the problem as well as the solution has to be defined (10 marks).

It is finally necessary to present arguments explaining why the claimed subject-matter is not obvious (15 marks). It is necessary to argue why the claimed subject-matter is not obvious either on the basis of document D1 alone or a combination of documents D1 and D2.

If additional independent claims have been formulated then 15 of the available marks for inventive step are reserved for discussing these claims.