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**D E C I S I O N**  
**of 15 September 2005**

**Case Number:** T 0696/04 - 3.3.03

**Application Number:** 94300205.5

**Publication Number:** 0607031

**IPC:** C08K 5/00

**Language of the proceedings:** EN

**Title of invention:**  
Heat radiation-shielding material

**Patentee:**  
Nippon Shokubai Co., Ltd.

**Opponent:**  
Bird, William E.

**Headword:**

-

**Relevant legal provisions:**  
EPC Art. 100(b), 100(c), 123(2), 56

**Keyword:**  
"Opposition grounds - extension of subject-matter (yes)"  
"Amendments - added subject-matter (yes)"  
"Sufficiency of disclosure"  
"Inventive step (no) - objective technical problem"

**Decisions cited:**  
G 0009/91, G 0001/03, T 0013/84, T 0840/93, T 0615/95,  
T 0577/97

**Catchword:**

-



Case Number: T 0696/04 - 3.3.03

**D E C I S I O N**  
of the Technical Board of Appeal 3.3.03  
of 15 September 2005

**Appellant:** NIPPON SHOKUBAI CO., LTD.  
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**Decision under appeal:** Decision of the Opposition Division of the  
European Patent Office posted 6 April 2004  
revoking European patent No. 0607031 pursuant  
to Article 102(1) EPC.

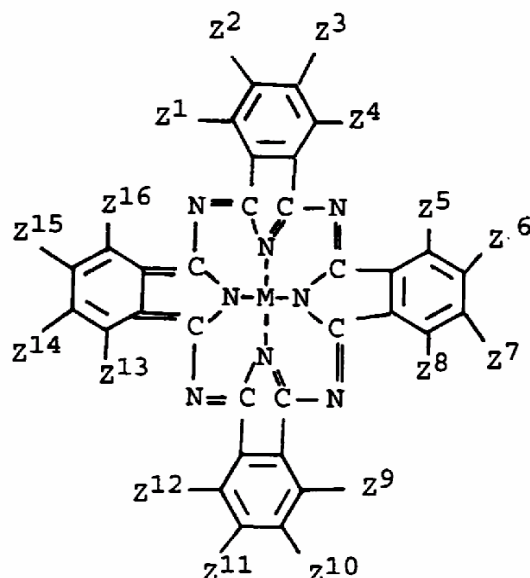
**Composition of the Board:**

**Chairman:** R. Young  
**Members:** W. Sieber  
E. Dufrasne

## Summary of Facts and Submissions

I. The mention of the grant of European patent No. 0 607 031, in respect of European patent application no. 94 300 205.5, filed on 12 January 1994 and claiming a JP priority of 13 January 1993 (JP 432693), was published on 6 October 1999 (Bulletin 1999/40). The granted patent contained 14 claims, whereby Claims 1 and 4 read as follows:

"1. A method for absorbing heat radiation while allowing visible light to pass, comprising the steps of adding into a transparent resin a phthalocyanine compound represented by the following general formula I:



wherein  $Z^1 - Z^{16}$  independently represent  $SR^1$ ,  $OR^2$ , a hydrogen atom, a halogen atom, or  $NHY$  where  $Y$  independently represents a phenyl group which may have a substituent or an alkyl group having 1-8 carbon atoms;  $R^1$  and  $R^2$  independently represent a phenyl group which may have a substituent or an alkyl group having 1-20

carbon atoms; and M represents a non-metal, metal, metal oxide or metal halide; provided that at least one of  $Z^1 - Z^{16}$  is NHY, so as to prepare a resin composition; and

forming the resin composition into a heat radiation-absorbing material, which is semi-transparent or transparent for visible light but blocks heat rays, wherein the content of the phthalocyanine in the article is 0.06 to 2.4 g/m<sup>2</sup>.

4. A method according to claim 2, wherein at least 6 of  $Z^2, Z^3, Z^6, Z^7, Z^{10}, Z^{11}, Z^{14}$  and  $Z^{15}$  in the general formula I are NHY.

The remaining claims are not of importance for this decision and consequently they will not be considered in further detail.

II. A notice of opposition was filed on 5 July 2000 by William E. Bird, European patent attorney, requesting revocation of the patent in its entirety on the grounds of Article 100(a) EPC, ie lack of novelty, lack of inventive step and lack of industrial applicability), and Article 100(b) EPC, ie lack of sufficiency of disclosure. The relevant documents during the opposition proceedings were:

D1: US-A-3 291 746;

D2: Pigment Handbook, vol. 1, Wiley, 1973, page 683;

D7: US-A-4 606 859;

Experimental report A (filed by the proprietor during examination);

Experimental report B (filed by the proprietor with letter dated 8 February 2001); and

Experimental report C (filed by the proprietor with letter dated 1 October 2003).

III. By a decision which was announced orally on 2 December 2003 and issued in writing on 6 April 2004, the opposition division revoked the patent. The decision was based on two sets of claims, namely a main request and a (sole) auxiliary request.

(a) Claim 1 of the main request corresponded to Claim 1 as granted, except that  $Z^1$  to  $Z^{16}$  were defined in the following terms whereby the matter compared to Claim 1 as granted has been struck through or underlined:

"... wherein  $Z^1 - Z^{16}$  independently represent  $SR^1$ ,  $OR^2$ , ~~a hydrogen atom~~, a halogen atom, or NHY where Y independently represents a phenyl group which may have a substituent or an alkyl group having 1-8 carbon atoms;  $R^1$  and  $R^2$  independently represent a phenyl group which may have a substituent or an alkyl group having 1 - 20 carbon atoms; and M represents a non-metal, metal, metal oxide or metal halide; provided that at least four of  $Z^2$ ,  $Z^3$ ,  $Z^6$ ,  $Z^7$ ,  $Z^{10}$ ,  $Z^{11}$ ,  $Z^{14}$  and  $Z^{15}$  are NHY and at least four of  $Z^1$ ,  $Z^4$ ,  $Z^5$ ,  $Z^8$ ,  $Z^9$ ,  $Z^{12}$ ,  $Z^{13}$  and  $Z^{16}$  are halogen atoms or  $SR^1$  or  $OR^2$ , ...".

Claim 3 corresponded to Claim 4 as granted (point I, above).

The remaining claims are not of importance for this decision and consequently they will not be considered in further detail.

The opposition division refused the main request because Claims 1 and 3 contravened Article 123(2) EPC.

- (b) Claim 1 of the auxiliary request corresponded to Claim 1 as granted, except that it referred to a "method for absorbing heat radiation to provide heat-radiation shielding ..., and forming the resin composition into a heat radiation-absorbing material, which is semi-transparent or transparent for visible light but blocks heat rays to act as a heat-radiation shielding article, ..." (amendments underlined), and "a hydrogen atom" was deleted as a possibility for  $Z^1$  to  $Z^{16}$ .

Claim 4 corresponded to Claim 4 as granted, except that the wording "and the total number of NHY substituents in  $Z^1$  to  $Z^{16}$  is 9 or less" was inserted at the end of the claim.

The remaining claims are not of importance for this decision and consequently they will not be considered in further detail.

The opposition division held that the claims of the auxiliary request met the requirements of Article 123(2), 83, 57 and 54 EPC. Nevertheless,

the auxiliary request was refused because the subject-matter of Claim 1 was considered to be obvious in view of D1 and D7. More specifically, it was held that a technical advantage with respect to the compounds of D1 had not been proven over the whole range claimed so that the objective technical problem had to be seen in the mere provision of a further method for providing shielding materials which absorb infrared. The solution to this problem was obvious from D7.

IV. On 1 June 2004, the proprietor (appellant) filed a notice of appeal against the above decision with simultaneous payment of the prescribed fee.

With the statement of grounds of appeal, filed on 16 August 2004, the proprietor (appellant) submitted a main request and a 1<sup>st</sup> to 8<sup>th</sup> auxiliary request whereby the 3<sup>rd</sup> and the 4<sup>th</sup> auxiliary request were identical with the main and then sole auxiliary request, respectively, before the opposition division.

The proprietor (appellant) disputed the finding of the opposition division that the claims of the main request contravened Article 123(2) EPC and that the claims of the auxiliary request were lacking an inventive step, and in particular its finding that:

- the provision of a technical advantage with respect to the compounds of D1 had not been proved over the whole range of the claims; and

- it would have been obvious to the skilled person in view of D7 to select at least some of the claimed compounds for use in the claimed method.

With respect to the issue of technical advantage, the proprietor (appellant) relied upon the test results in Experimental Test Reports A, B and C. In addition, it filed an Experimental Report D which compared the light transmission properties of compounds of the invention with the corresponding properties of the vanadyl phthalocyanine compound (VOPc) disclosed in D1. Samples of the resins tested in Experimental Report D were also submitted.

Contrary to the finding of the opposition division, the objective technical problem addressed by the invention was the provision of methods for forming heat-radiation shielding articles which exhibited improved qualities compared to those disclosed in D1. The experimental tests showed that the claimed compounds might be used to create heat-radiation shielding materials that exhibited a ratio of  $T_v/T_e$  (transmittance of visible light to transmittance of heat rays) that was at least as good as, and in many cases better than, the compound VOPc of D1. Furthermore, the compounds of the invention exhibited a substantially superior freedom from haze compared to VOPc. There was nothing in the teaching of D7 that would have led the skilled person to imagine that adoption of the claimed compounds in place of VOPc would have led to heat-radiation shielding articles with improved properties, for example an effective  $T_v/T_e$  ratio in combination with a substantially enhanced freedom from haze. In addition, D7 taught compounds which were different from those now claimed. It might



even be doubted that D7 contained any enabling disclosure at all, since it could be seen from Experimental Report B that two of the disclosed compounds that might reasonably be assumed to be among those which were least dissimilar to those of the present claims were extremely unstable and could not be isolated. Certainly, there was no reasonable basis for concluding that the skilled person would have combined the teaching of D7 with that of D1 to arrive at the invention as claimed in any of the proprietor's requests.

Even if the compounds of the invention exhibited no superior technical effect, the claims of all requests would still possess an inventive step with regard to the teachings of D1 and D7. If the objective problem to be solved by the invention was simply the provision of alternative infra-red absorbing compounds in place of the VOPc of D1, the teaching of D7 did not provide the solution provided by the claims. This was because D7 disclosed a range of compounds that were different from those required in the claims.

V. The submissions of the opponent (respondent) provided in the letters dated 16 December 2004 and 15 March 2005 can be summarized as follows:

- (a) It was requested that the late filed evidence (Samples and Experimental Report D) not be admitted to the proceedings. Furthermore, the board was requested to confine the appeal to the consideration of the requests considered by the opposition division (ie the 3<sup>rd</sup> and 4<sup>th</sup> auxiliary request) and not to allow new requests.

- (b) As regards the substantive issues, the opponent (respondent) raised objections under Articles 123(2), 84, 83 and 56 EPC against various requests filed by the proprietor (appellant).

With respect to Article 123(2) EPC, it was *inter alia* argued that the removal of the option "hydrogen" from an originally disclosed list of possible substituents (eg Claim 1 of the main request before the opposition division and now the 3<sup>rd</sup> auxiliary request; point III(a), above) effectively amounted to a disclaimer of hydrogen in those circumstances. Following the principles laid down in G 1/03 (OJ EPO 2004, 413), a disclaimer to hydrogen was not allowable since it was used in the present case in an attempt to improve the inventive step position.

As regards inventive step, it was pointed out that Experimental Reports A to C and the experimental evidence in the patent in suit did not demonstrate any advantage of the claimed methods over D1, ie the closest state of the art. Also Experimental Report D did not demonstrate any advantage in the  $T_v/T_e$  ratio either. Furthermore, it was impermissible to reformulate the problem to be solved as being the provision of methods which provided lower haze since there was no disclosure of any improvements in haze in the application as originally filed (following T 13/84, OJ EPO 1986, 253). Therefore, since no advantage could be seen across the whole range of claimed methods compared with D1, the opposition division had been correct

to conclude that the problem solved over D1 was the mere provision of a further method for providing heat-shielding materials which absorb infra-red light.

The claimed solution was to be found in the remaining prior art, eg D7, which disclosed phthalocyanine compounds falling within the claimed range of compounds and described their use for heat-shielding applications including sun visors and vehicle windscreens. Hence, it was obvious to combine the compounds of D7 with the heat-shielding methods described in D1. It was also to be expected in view of column 2 of D7, according to which the compounds had 90% of their absorption strength at or above 750 nm (ie heat radiation), that the  $T_v/T_e$  ratio would be high. The skilled person therefore had further motivation to use these compounds in the methods of D1.

There was also no experimental evidence which showed that the more limited ranges of compounds in the auxiliary requests were superior to the compounds of the main request or compared to the prior art. The claims of the proprietor's (appellant's) numerous requests merely targeted compounds which were arbitrary selections from within the broader teaching of D7 (by virtue of exhibiting no superior technical effect across the full width of claims). Accordingly, the subject-matter of all requests was obvious.

- VI. In response to the board's communication, issued on 24 May 2005 accompanying a summons to oral proceedings, and the submissions made by the opponent (respondent), the proprietor (appellant) filed with letter dated 15 August 2005 a further Experimental Report E and an amended version of the main request and amended versions of the 1<sup>st</sup>, 2<sup>nd</sup>, 6<sup>th</sup>, 7<sup>th</sup> and 8<sup>th</sup> auxiliary requests.
- VII. In the letters dated 10 August 2005 and 24 August 2005, the opponent (respondent) maintained its argument that there was no advantage in using the claimed compounds compared with the prior art.
- VIII. On 15 September 2005, oral proceedings were held before the board.

In order to correct an obvious error in the main request, the proprietor (appellant) filed an amended page 24 of the granted patent which replaced the corresponding page of the main request.

The opponent (respondent) maintained its requests not to admit new requests and new experimental evidence into the proceedings.

The opponent (respondent) objected under Article 123(2) EPC against the proviso introduced into Claim 1 of the main, 1<sup>st</sup> and 2<sup>nd</sup> auxiliary request. Furthermore it objected against Claim 4 of these requests which had been refused by the opposition division in view of Article 123(2) EPC.

After withdrawal of the 3<sup>rd</sup> auxiliary request, the discussion focussed on the question as to whether or not the claimed subject-matter of the 4<sup>th</sup> auxiliary request was patentable. The opponent (respondent) argued that the subject-matter of Claim 1 lacked sufficiency of disclosure since it covered compounds that could not be produced as was evident from the proprietor's (appellant's) Experimental Report B. With respect to inventive step, both parties basically relied on their written submissions. The proprietor (appellant) relied upon haze as a technical advantage of the claimed invention whereas the opponent argued that this effect was not originally disclosed and therefore could not be taken into account. Furthermore, the proprietor (appellant) argued that, even if the technical effect "haze" were to be disregarded, the subject-matter of Claim 1 was not obvious over a combination of D1 and D7. D1 was not concerned with the total IR spectrum of the disclosed compounds, and D7, if an enabling disclosure at all, covered an enormous range of compounds so that the skilled person would only consider the examples of D7. In addition, D7 contained only a passing reference to possible uses of the compounds which appeared to be speculative.

After discussing the 5<sup>th</sup> to 8<sup>th</sup> auxiliary requests, the proprietor (appellant) filed a 9<sup>th</sup> auxiliary request.

- IX. The proprietor (appellant) requested that the decision under appeal be set aside and that the patent be maintained on the basis of

main request:

Claim 1 (first two lines) as granted,  
Claims 1 (remainder), 2 to 7, 8 (first line) as filed  
at the oral proceedings,  
Claims 8 (remainder), 9 to 12 as filed with the letter  
dated 15 August 2005; or, in the alternative,

1<sup>st</sup> auxiliary request:

Claims 1 to 12 as filed with letter dated  
15 August 2005; or

2<sup>nd</sup> auxiliary request:

Claims 1 to 12 as filed with letter dated  
15 August 2005; or

(3<sup>rd</sup> auxiliary request withdrawn)

4<sup>th</sup> auxiliary request:

Claims 1 to 9, 10 (first line) as filed with letter  
dated 16 August 2004,  
Claims 10 (second line), 11 to 14 as granted; or

5<sup>th</sup> auxiliary request:

Claims 1 to 13 as filed with letter dated  
16 August 2004; or

6<sup>th</sup> auxiliary request:

Claim 1 (first two lines) as granted,  
Claims 1 (remainder), 2 to 10 as filed with letter  
dated 15 August 2005; or

7<sup>th</sup> auxiliary request:

Claims 1 to 10 as filed with letter dated  
15 August 2005; or

8<sup>th</sup> auxiliary request:

Claims 1 to 10 as filed with letter dated  
15 August 2005;

9<sup>th</sup> auxiliary request:

Claims 1 to 9 as filed at the oral proceedings.

- (a) Claim 1 of the main request corresponds to Claim 1 as granted, except that Z<sup>1</sup> to Z<sup>16</sup> are defined in the following terms whereby the matter compared to Claim 1 as granted has been underlined:

"... wherein Z<sup>1</sup> - Z<sup>16</sup> independently represent SR<sup>1</sup>, OR<sup>2</sup>, a hydrogen atom, a halogen atom, or NHY where Y independently represents a phenyl group which may have a substituent or an alkyl group having 1-8 carbon atoms; R<sup>1</sup> and R<sup>2</sup> independently represent a phenyl group which may have a substituent or an alkyl group having 1 - 20 carbon atoms; and M represents a non-metal, metal, metal oxide or metal halide; either provided that at least one of Z<sup>1</sup> - Z<sup>16</sup> is NHY and at least four of Z<sup>1</sup>, Z<sup>4</sup>, Z<sup>5</sup>, Z<sup>8</sup>, Z<sup>9</sup>, Z<sup>12</sup>, Z<sup>13</sup> and Z<sup>16</sup> are halogen atoms or OR<sup>2</sup>, or provided that four or eight of Z<sup>1</sup> - Z<sup>16</sup> are NHY and respectively twelve or eight of Z<sup>1</sup> - Z<sup>16</sup> are SR<sup>1</sup>, so as to prepare ...".

Claim 4 corresponded to Claim 4 as granted  
(point I, above).

The remaining claims are not of importance for this decision and consequently they will not be considered in further detail.

- (b) The 1<sup>st</sup> auxiliary request corresponds to the main request, except that in Claim 1 "a hydrogen atom" is deleted as a possibility for  $Z^1$  to  $Z^{16}$ .
- (c) The 2<sup>nd</sup> auxiliary request corresponds to the 1<sup>st</sup> auxiliary request, except that Claim 1 refers to a "method for absorbing heat radiation to provide heat-radiation shielding ..., and forming the resin composition into a heat radiation-absorbing material, which is semi-transparent or transparent for visible light but blocks heat rays to act as a heat-radiation shielding article, ..." (amendments underlined).
- (d) The 3<sup>rd</sup> auxiliary request was withdrawn.
- (e) The 4<sup>th</sup> auxiliary request corresponds to the (sole) auxiliary request underlying the decision under appeal (point III(b), above).
- (f) Claim 1 of the 5<sup>th</sup> auxiliary request corresponds to Claim 1 of the 4<sup>th</sup> auxiliary request, except that "OR<sup>2</sup>" has been deleted as a possibility for  $Z^1$  to  $Z^{16}$ .

Claim 4 corresponds to Claim 4 of the 4<sup>th</sup> auxiliary request.

The remaining claims are not of importance for this decision and consequently they will not be considered in further detail.



- (g) Claim 1 of the 6<sup>th</sup> auxiliary request corresponds to Claim 1 as granted, except that Z<sup>1</sup> to Z<sup>16</sup> are defined in the following terms whereby the matter compared to Claim 1 as granted has been underlined:

"... wherein Z<sup>1</sup> - Z<sup>16</sup> independently represent SR<sup>1</sup>, OR<sup>2</sup>, a hydrogen atom, a halogen atom, or NHY where Y independently represents a phenyl group which may have a substituent or an alkyl group having 1-8 carbon atoms; R<sup>1</sup> and R<sup>2</sup> independently represent a phenyl group which may have a substituent or an alkyl group having 1 - 20 carbon atoms; and M represents a non-metal, metal, metal oxide or metal halide; the phthalocyanine compound being chosen from: Pc(NHY)<sub>8</sub>X<sub>8</sub>, Pc(NHY)<sub>4</sub>X<sub>12</sub>, Pc(NHY)<sub>8</sub>(OR<sup>2</sup>)<sub>8</sub>, Pc(NHY)<sub>4</sub>(OR<sup>2</sup>)<sub>12</sub>, Pc(NHY)<sub>8</sub>H<sub>8</sub>, Pc(NHY)<sub>4</sub>H<sub>12</sub>, Pc(NHY)<sub>8</sub>(SR<sup>1</sup>)<sub>8</sub>, Pc(NHY)<sub>4</sub>(SR<sup>1</sup>)<sub>12</sub>, where Pc represents the whole of general formula I apart from Z<sup>1</sup> to Z<sup>16</sup> and X = halogen, ...".

The remaining claims are not of importance for this decision and consequently they will not be considered in further detail.

- (h) The 7<sup>th</sup> auxiliary request corresponds to the 6<sup>th</sup> auxiliary request, except that in Claim 1 the definition for Z<sup>1</sup> to Z<sup>16</sup> is further restricted:

"... wherein Z<sup>1</sup> - Z<sup>16</sup> independently represent SR<sup>1</sup>, OR<sup>2</sup>, a fluorine atom, or NHY where Y independently represents a phenyl group which may have a substituent or an alkyl group having 1-8 carbon atoms; R<sup>1</sup> and R<sup>2</sup> independently represent a phenyl group which may have a substituent or an alkyl

group having 1 - 20 carbon atoms; and M represents a non-metal, metal, metal oxide or metal halide; the phthalocyanine compound being chosen from:  $Pc(NHY)_8F_8$ ,  $Pc(NHY)_4F_{12}$ ,  $Pc(NHY)_8(OR^2)_8$ ,  $Pc(NHY)_4(OR^2)_{12}$ ,  $Pc(NHY)_8(SR^1)_8$  and  $Pc(NHY)_4(SR^1)_{12}$ , where Pc represents the whole of general formula I apart from  $Z^1$  to  $Z^{16}$ , ...".

- (i) The 8<sup>th</sup> auxiliary request corresponds to the 7<sup>th</sup> auxiliary request, except that Claim 1 refers to a "method for absorbing heat radiation to provide heat-radiation shielding ..., and forming the resin composition into a heat radiation-absorbing material, which is semi-transparent or transparent for visible light but blocks heat rays to act as a heat-radiation shielding article, ..." (amendments underlined).
- (j) Claim 1 of the 9<sup>th</sup> auxiliary request corresponds to Claim 1 as granted, except that  $Z^1$  to  $Z^{16}$  are defined as follows whereby the matter compared to Claim 1 as granted has been underlined:

"... wherein  $Z^1 - Z^{16}$  independently represent  $SR^1$ ,  $OR^2$ , a hydrogen atom, a halogen atom, or NHY where Y independently represents a phenyl group which may have a substituent or an alkyl group having 1-8 carbon atoms;  $R^1$  and  $R^2$  independently represent a phenyl group which may have a substituent or an alkyl group having 1 - 20 carbon atoms; and M represents a non-metal, metal, metal oxide or metal halide; the phthalocyanine compound being chosen from:  $Pc(NHY)_8X_8$ ,  $Pc(NHY)_4X_{12}$ ,  $Pc(NHY)_8(OR^2)_8$  and  $Pc(NHY)_4(OR^2)_{12}$ , where Pc represents the whole

of general formula I apart from Z<sup>1</sup> to Z<sup>16</sup> and  
X = halogen, ...".

The remaining claims are not of importance for this decision and consequently they will not be considered in further detail.

- X. The opponent (respondent) requested that the appeal be dismissed.

### **Reasons for the Decision**

1. The appeal complies with Articles 106 and 108 EPC and Rule 64 EPC and is therefore admissible.

2. *Procedural matters*

- 2.1 Admissibility of the main request and the 1<sup>st</sup>, 2<sup>nd</sup> and 5<sup>th</sup> to 8<sup>th</sup> auxiliary request

- 2.1.1 Whilst the proprietor (appellant) has maintained its (sole) auxiliary request from the proceedings before the opposition division (now the 4<sup>th</sup> auxiliary request), it also has filed during the opposition appeal proceedings a new main request and a new 1<sup>st</sup>, 2<sup>nd</sup> and 5<sup>th</sup> to 8<sup>th</sup> auxiliary request which had not been considered by the opposition division. Since the new requests involved substantial amendments to the claims which would require further examination, the opponent (respondent) requested that these new requests not be admitted into the proceedings and that the appeal be confined to the consideration of the request considered by the opposition division, ie the 4<sup>th</sup> auxiliary request.

2.1.2 However, as stated in G 9/91 (OJ EPO 1993, 408; paragraph 18 of the reasons), "The purpose of the appeal procedure *inter partes* is mainly (emphasis by the board) to give the losing party the possibility of challenging the decision of the Opposition Division on its merits". In other words, it is not exclusively the function of an appeal to give a judicial decision upon the correctness of a decision taken by a first instance department, in this case the opposition division.

Thus, in general, admission of a new request put forward by a proprietor on appeal being not identical to the ones already before the opposition division is a matter of discretion of the appeal board. In the past, the practice of the boards of appeal in this respect has been generous, even if new requests with claims of considerably altered scope had been submitted, because such new requests are very often the last chance for the proprietor to obtain any patent for the particular subject-matter (eg T 840/93, OJ EPO, 1996, 335, point 3.2 of the reasons). This is entirely true in the present case where the patent has been revoked by the opposition division.

2.1.3 Furthermore, the main request and the 1<sup>st</sup>, 2<sup>nd</sup> and 5<sup>th</sup> to 8<sup>th</sup> auxiliary request (or at least the first versions thereof) were filed at the earliest possible date, namely together with the statement of grounds of appeal. The further amended versions of the main request and the 1<sup>st</sup>, 2<sup>nd</sup> and 6<sup>th</sup> to 8<sup>th</sup> auxiliary request either were filed in response to observations made by the opponent (respondent) or represented more restricted versions of the initially filed requests.

2.1.4 Finally, no apparent difficulty arose with respect to the examination of the amended claims.

2.1.5 In view of the above, the main request and the 1<sup>st</sup>, 2<sup>nd</sup> and 5<sup>th</sup> to 8<sup>th</sup> auxiliary request were admitted into the proceedings.

2.2 Admissibility of the 9<sup>th</sup> auxiliary request

2.2.1 The opponent (respondent) also objected to the admissibility of the 9<sup>th</sup> auxiliary request submitted during the oral proceedings for being late filed and for being not allowable with respect to inventive step.

2.2.2 As explained in point 2.1.2, above, admission of new requests put forward by a proprietor is a matter of discretion of the appeal board. Furthermore, it was held in T 577/97 of 5 April 2000 (not published in the OJ EPO; point 3 of the reasons) that a board "has at least the discretion to accept amended claims at any stage of the opposition proceedings, thus also during the oral proceedings".

2.2.3 If, as in the present case, it turns out during the discussion at the oral proceedings that the claims of the requests on file do not meet the requirements of the EPC, it is justifiable to give the proprietor an opportunity to overcome the objections, eg by limiting the claims accordingly. In the present case, the board has no doubt that the new request was a serious attempt by the proprietor to overcome the objections raised at the oral proceedings against the claims on file. Since the nature of the amendments presented was very similar

to those in the other requests, the new request could neither occasion surprise nor any unreasonable difficulty of understanding. Consequently, to refuse the new request solely on the ground that it was filed too late would have been a too formalistic approach. Thus, the board considers that the extremely late filing of the request does not constitute a bar to the admissibility of the 9<sup>th</sup> auxiliary request.

2.2.4 The claims of this request also fulfilled the criterion of being *prima facie* allowable with respect to Articles 123 and 84 EPC. Furthermore, the request was simple and clear enough to be understood immediately.

As regards the argument of the opponent (respondent) that the request was not allowable with respect to inventive step and therefore should not be admitted, it is at least questionable whether this criterion is a valid condition at all to allow or refuse admission of a late-filed request of a proprietor in appeal proceedings if this issue requires, as in the present case, a detailed discussion.

2.2.5 Although the filing of new requests at a late stage of appeal proceedings is in any case undesirable, the board can nevertheless see no abuse of the procedure in the present case by the proprietor (appellant) which would justify the refusal of the request, since the further limitation of claims could hardly take the opponent by surprise.

2.2.6 Therefore, the 9<sup>th</sup> auxiliary request was also admitted into the proceedings.

2.3 Admissibility of late-filed evidence

2.3.1 The opponent (respondent) requested that the late-filed product samples and Experimental Reports D and E not be admitted into the proceedings because the proprietor (appellant) had had ample opportunity to submit the evidence earlier.

However, in the board's view, the further experiments are *prima facie* relevant to the issue of inventive step and were filed, as pointed out by the proprietor (appellant), either in response to the decision under appeal (product samples and Experimental Report D) or in response to objections raised by the opponent (respondent) (Experimental Report E). Consequently, the board decided to admit both reports into the proceedings.

3. *Main request*

3.1 Although Article 100(c) EPC was not a ground of opposition in the present case, the opposition division has considered this ground during the opposition proceedings and in the decision under appeal.

The opposition division objected "on its own volition" against Claim 3 of the main request then on file which was, apart from being renumbered and being amended with respect to the dependency, identical with Claim 4 as granted. It was held that Claim 3 did not meet the requirements of Article 123(2) EPC (point 2.5 of the minutes and point 3.2 of the decision under appeal).

Consequently, Article 100(c) EPC is in the present opposition appeal proceedings.

3.2 Claim 4 of the main request is identical with Claim 4 as granted (point I, above) and requires that at least 6 of  $Z^2$ ,  $Z^3$ ,  $Z^6$ ,  $Z^7$ ,  $Z^{10}$ ,  $Z^{11}$ ,  $Z^{14}$  and  $Z^{15}$  in the general formula I are NHY. However, as pointed out in point 3.2 of the decision under appeal, this feature has been disclosed in the application as originally filed only in combination with another feature, namely that the total number of NHY substituents in  $Z^1 - Z^{16}$  is 9 or less (see Claim 4 as originally filed and page 7, lines 21 to 24 of the application as originally filed). Since, however, the latter feature has been omitted in Claim 4, Claim 4 does not meet the requirements of Article 123(2) EPC.

3.3 Claim 4 of the main request being not allowable, the main request has to be refused.

4. *1<sup>st</sup> and 2<sup>nd</sup> auxiliary request*

Claim 4 of the 1<sup>st</sup> and 2<sup>nd</sup> auxiliary requests is identical with Claim 4 of the main request and Claim 4 as granted, respectively. The same conclusion applies, therefore, to Claim 4 of these requests as is reached by the board in relation to Claim 4 of the main request. Consequently, the 1<sup>st</sup> and 2<sup>nd</sup> auxiliary requests are refused.

5. It may be convenient to recall at this juncture that the 3<sup>rd</sup> auxiliary request has been withdrawn.



6. 4<sup>th</sup> auxiliary request

6.1 Amendments

6.1.1 Claims 1 and 4 of the 4<sup>th</sup> auxiliary request, which is identical with the (sole) auxiliary request considered by the opposition division (point III(b), above), correspond to Claims 1 and 4 as granted, subject to the following amendments :

(a) Claim 1 refers to a "method for absorbing heat radiation to provide heat-radiation shielding ..., and forming the resin composition into a heat radiation-absorbing material, which is semi-transparent or transparent for visible light but blocks heat rays to act as a heat-radiation shielding article, ..." (amendments underlined).

(b) In Claim 1, "a hydrogen atom" has been deleted as a possibility for Z<sup>1</sup> to Z<sup>16</sup>.

(c) At the end of Claim 4, the wording "and the total number of NHY substituents in Z<sup>1</sup> to Z<sup>16</sup> is 9 or less" has been inserted.

6.1.2 Although the exact wording of amendment (a) cannot be found in the patent in suit (and in the application as originally filed, respectively), it is evident from page 2, line 7 of the patent in suit (page 1, lines 6 to 8 of the application as originally filed) that the invention relates to a heat radiation-shielding material. The use of the word "article" in the second part of the amendment (ie "to act as a heat-radiation shielding article") does not add subject-matter because

the terms "article" and "material" are used synonymously in the patent in suit. This interpretation is confirmed by the passage on page 11, lines 20 to 21 in the patent specification (page 22, lines 6 to 11 of the application as originally filed) which refers to the thickness of the heat radiation-shielding material although the term "article" in connection with thickness appears more appropriate than "material". Thus, the board agrees with the opposition division that there is an implicit basis for amendment (a) in the patent in suit and in the application as originally filed, respectively.

6.1.3 Claim 1 as granted and Claim 1 as originally filed, respectively, contain a list of substituents for  $Z^1$  to  $Z^{16}$  of the generic chemical formula I, namely  $SR^1$ ,  $OR^2$ , a hydrogen atom, a halogen atom and NHY. The deletion of hydrogen from this list of alternative definitions disclosed in the application as originally filed, ie amendment (b), is not objectionable under Article 123(2) EPC as that limitation does not result in singling out a particular combination of specific definitions but maintains the remaining subject-matter of claim 1 as a generic list of alternative definitions differing from the original lists only by their smaller size (eg T 615/95 of 16 December 1997, point 6 of the reasons; not published in OJ EPO).

The board further notes that amendment (b) is supported by the list of exemplified compounds of Groups 1 to 4, 7 and 8 in the patent in suit and in the application as originally filed, respectively.

- 6.1.4 The amendment in Claim 4, ie amendment (c), overcomes the objection which arose against Claim 4 of the main request (point 3.2, above). The amendment is disclosed on page 4, lines 39 to 40 (page 7, lines 21 to 24 of the application as originally filed and Claim 4 as originally filed), and, therefore, meets the requirements of Article 123(2) EPC.
- 6.1.5 The opponent (respondent) argued that the omission of hydrogen from an originally disclosed list of possible list of possible substituents effectively amounted to a disclaimer, and, therefore, the criteria laid down in decision G 1/03 (OJ EPO, 2004, 413) must be applied in order to assess the allowability of the amendments. However, this argument has to be disregarded because the omission of an element of a list does not result in a disclaimer within the meaning of G 1/03 (supra). In this decision, the term "disclaimer" is defined as "an amendment to a claim resulting in the incorporation therein of a "negative" technical feature, typically excluding from a general feature specific embodiments which have not been disclosed in the application as originally filed" (point 2 of the reasons). In the case of deletion of an element from a list, rather the criteria of "singling out" apply (point 6.1.3, above).
- 6.1.6 As regards the remaining claims, the board is satisfied that they meet the requirements of Article 123 EPC. However, since they are not relevant for this decision, they will not be considered in further detail.
- 6.1.7 In summary, the amendments to the claims of the 4<sup>th</sup> auxiliary request meet the requirements of Article 123(2) EPC.

## 6.2 Sufficiency of disclosure

6.2.1 The opponent (respondent) argued that the claims covered compounds in which the substituents were not restricted to any particular positions on the phthalocyanine nucleus, whereas the description only taught compounds in which the substituents were located at very specific positions on the phthalocyanine nucleus. The usefulness of compounds in which the substituents were randomly distributed on the phthalocyanine nucleus had not been demonstrated. This argument is, however, not convincing for the following reasons:

Firstly, the description does not **only** teach compounds in which the position of the substituents on the phthalocyanine nucleus is indicated. For example, the formulae in the headings of Group 1 to 8 type compounds in the patent in suit and the application as originally filed, respectively, do not identify the position of the substituents. Secondly, even if usefulness were to be interpreted in the sense of Article 83 EPC (ie whether or not the claimed method could be carried out by the skilled person with compounds having randomly distributed substituents) the onus of proof for this allegation lies in opposition proceedings with the opponent. In the present case, the opponent (respondent) has not provided any evidence for its allegation.

6.2.2 The opponent (respondent) argued that the method of Claim 1 covered phthalocyanine compounds that could not be produced as was evident from the proprietor's (appellant's) Experimental Report B. According to

Experimental Report B, the proprietor (appellant) failed to reproduce hexadeca(anilino)H<sub>2</sub>Pc and hexadeca(ethylamino)H<sub>2</sub>Pc, two compounds disclosed in D7 but also falling within the scope of Claim 1.

However, even a well-intentioned proprietor (appellant) may, when reproducing a chemical process disclosed in the prior art, meet with failures which can only be overcome by additional experiments that he could reasonably be expected to perform. In the present case, however, no information is given in Experimental Report B with respect to details of the synthesis of the two compounds or any details on additional experiments. Thus, solely on the basis of Experimental Report B the board cannot concur with the opponent's (respondent's) assertion that the claimed subject-matter lacked sufficiency of disclosure.

6.2.3 In summary, the subject-matter of Claim 1 and, consequently, the subject-matter of the remaining claims meets the requirements of Article 83 EPC.

### 6.3 Novelty

Novelty of the subject-matter of the claims of the 4<sup>th</sup> auxiliary request (which is identical with the (sole) auxiliary request underlying the decision under appeal) was acknowledged by the opposition division. Nor was any objection raised by the opponent (respondent) in this respect. Also the board is satisfied that the claims of the 4<sup>th</sup> auxiliary request meet the requirements of Article 54 EPC.

6.4 The patent in suit; the technical problem

6.4.1 The patent in suit is concerned in general terms with the production of heat radiation-shielding articles which absorb near infrared rays. The resin used to produce these articles contains a phthalocyanine compound which has excellent ability to absorb near infrared rays, excellent compatibility to resins, and excellent light fastness, with superior effect to allow visible light rays to pass while blocking heat rays (page 2, lines 7 to 10 of the patent specification).

6.4.2 The use of metal phthalocyanines as infrared absorbers in organic plastic substrates is known from D1. The infrared absorber employed in D1 is either vanadyl phthalocyanine (VOPc) or dihydroxygermanium phthalocyanine (Claim 1). Organic plastic material containing these phthalocyanines can be moulded into formed articles such as sheets and plates (column 4, lines 30 to 32) whereby the amount of phthalocyanine in the plastic material is from 0.01 to 0,184 g/ft<sup>2</sup> (Claim 1). The phthalocyanines decrease the infrared transmission while allowing a relatively high transmittance of visible light (Table V). Possible applications for materials that transmit a major portion of the visible radiation but at the same time effectively block near infrared radiation are sunglasses, welder's goggles and other eye protective filters and windows (column 2, lines 41 to 46).

Therefore, D1 is considered by the board, in line with both parties and the opposition division, to represent the closest prior art.

- 6.4.3 The process claimed in Claim 1 of the main request differs from this closest prior art only in that phthalocyanine compounds of formula (I) are used instead of VOPc or dihydroxygermanium phthalocyanine.
- 6.4.4 It is evident from the above analysis that both the patent in suit and the closest prior art provide heat radiation-shielding materials. Thus, the salient point in the present case is whether the use of the specific phthalocyanine compound required in Claim 1 of the main request yields a product with improved properties (as argued by the proprietor (appellant)) or a product having the same properties as the prior art (as argued by the opponent (respondent)). The outcome of this issue is important because in this step of the problem-solution approach the technical effect(s), if any, that the patent in suit provides over the closest prior art are taken into account when formulating the objective technical problem.
- 6.4.5 The proprietor (appellant) alleges that the problem should be seen as the provision of improved methods for forming heat radiation-shielding material because of advantages in the ratio of  $T_v/T_e$  and freedom of haze when using the phthalocyanine compounds of formula (I).
- 6.4.6 The patent in suit discloses data relating to the transmittance of visible light rays ( $T_v$ ) and the transmittance of heat rays ( $T_e$ ) which can be used to calculate the  $T_v/T_e$  ratio referred to by the proprietor (appellant). During the opposition proceedings (letter dated 1 October 2003), the proprietor has indicated that the value for  $T_v/T_e$  of the great majority of commercial transparent heat radiation shielding products is 1.0 or more. However, it is quite clear

from Tables 2, 4, and 5 in the patent in suit that only some phthalocyanine compounds yield a  $T_v/T_e$  ratio above 1.0 whereas many compounds according to the definition in Claim 1 have  $T_v/T_e$  ratios below 1.0 (eg Examples 11 to 13, 18 to 21, 32 to 36).

Also Experimental Report D does not demonstrate any advantage in  $T_v/T_e$  either. For instance, in Table 1 of Experimental Report D, whilst the transparent sheet containing the compound VOPc of the closest prior art has a  $T_v/T_e$  ratio of 0.96, at least half of the sheets containing compounds according to the definition in Claim 1 of the main request (eg Runs 2, 3, 5 and 7) have worse  $T_v/T_e$  ratios than the sheet with the prior art compound, in fact the compound used in Run 7 leads to an extremely poor  $T_v/T_e$  ratio of 0.54.

The same is true for Experimental Report E. Run 3 in Table 2 of Experimental Report E reports for a sheet containing VOPc(PhNH)<sub>4</sub>F<sub>12</sub> a  $T_v/T_e$  ratio of 0.48. The compound used in Run 3, VOPc(PhNH)<sub>4</sub>F<sub>12</sub>, is clearly within the scope of Claim 1 of the main request.

Thus, the data in the patent in suit and the experimental evidence provided by the proprietor (appellant) do not show any superiority with respect to heat shielding over the whole range claimed.

6.4.7 The proprietor further alleged that there were advantages relating to the haze of the articles. Although the experimental reports of the proprietor (appellant), and in particular Experimental Reports D and E, show an improvement in haze, it is conspicuous to the board that the application as originally filed reports only the performance of visible and heat



radiation transmittance of the material but refers neither explicitly nor implicitly to haze. However, it is not allowable to rely upon a technical effect that cannot be deduced by the person skilled in the art from the application as filed when considered in the light of the prior art which is nearest to the invention for formulating the objective technical problem (eg T 13/84, OJ EPO 1986, 253).

Furthermore, the results with regard to haze obtained by the proprietor (appellant) in its experimental reports appear to be inconsistent with the disclosure of D1. Thus, D1 reports for Example 1 that poly(methyl methacrylate) panels were prepared in which the metal phthalocyanines, ie VOPc and dihydroxygermanium phthalocyanine, were uniformly dispersed therethrough (column 4, lines 68 to 70). The passage following provides a detailed description of the mixing procedure. On the other hand, the proprietor (appellant) reports for cast polymerization of methyl methacrylate with VOPc a heterogeneous appearance with particles throughout the sheet (eg Experimental Report A). Since haze is a parameter which reflects, according to the appellant (proprietor), the presence of undispersed particles, it may be that the prior art compound has not been properly dispersed in the experimental reports which is why the haze is higher. More importantly, it is beyond doubt that phthalocyanine compounds have been used as pigments in plastics for many years and that transparency (ie freedom from haze) is readily achieved. D2, which is a standard textbook on pigments, states at page 683 (second column, fourth paragraph) that "Phthalocyanines are transparent in clear plastic films when properly dispersed". The proper dispersion will

always depend upon numerous factors such as the phthalocyanine particle size, crystallinity and milling conditions. It appears from Experimental Report A that even the moulding conditions will affect the dispersability. Thus, the parameter haze is not necessarily linked to the phthalocyanine compound itself but to conditions which are not part of the claimed method. Hence, also for this reason the alleged effect relating to haze cannot be taken into account when formulating the objective technical problem.

6.4.8 Therefore, since no improvement with respect to the  $T_v/T_e$  ratio can be seen across the whole range of claimed methods compared with D1, and the effect haze cannot be taken into account for the reasons given in point 6.4.7, above, the problem to be solved can only be seen in the mere provision of further methods for providing heat radiation shielding materials.

6.4.9 From the above discussion of the data in the patent in suit and in Experimental Reports A to E it is evident that this objective technical problem is solved by the features of Claim 1 of the 4<sup>th</sup> auxiliary request.

6.5 Inventive step

6.5.1 It remains to be decided whether or not the proposed solution, ie the use of phthalocyanine compounds of formula (I), is obvious from the prior art.

6.5.2 D7 discloses phthalocyanine compounds and describes their use for infrared protection systems, such as welding goggles, sun visors and vehicle windscreens (column 6, lines 33 to 35), ie exactly the same uses

referred to at page 2, lines 10 to 12 in the patent in suit. Thus, the proprietor's (appellant's) assertion that D7 discloses heat radiation-shielding only in a speculative way is not correct.

At least five of the peripheral carbon atoms in the phthalocyanine compounds of D7 are linked by an atom from Group VB or Group VIB of the Periodic Table, other than oxygen, to a carbon atom of an organic radical. The remaining peripheral atoms of the phthalocyanine nucleus may be unsubstituted, ie carry hydrogen atoms, or be substituted by other groups, for example, halogen atoms or amino groups (column 1, lines 9 to 53). Thus, the phthalocyanine compounds may contain an aliphatic, alicyclic or aromatic radical linked by a sulphur or nitrogen atom to the phthalocyanine nucleus (column 2, lines 14 to 15).

In particular, D7 explicitly discloses hexadecanilino-H<sub>2</sub>Pc (column 4, line 39) and hexadeca(ethylamino)H<sub>2</sub>Pc (column 4, line 50) which clearly fall within the definition of general formula (I) of the 4<sup>th</sup> auxiliary request.

Thus, faced with the objective technical problem defined in point 6.4.8, above, the skilled person would consider all phthalocyanine compounds taught in D7 as being equally suitable to solve that problem. The skilled person would arbitrarily select a compound covered by the teaching of D7, and in particular any explicitly disclosed compound, thereby arriving inevitably at a compound meeting the definition in Claim 1 of the 4<sup>th</sup> auxiliary request.

- 6.5.3 Hence, the subject-matter of Claim 1 of the 4<sup>th</sup> auxiliary request is not based on an inventive step (Article 56 EPC).
- 6.5.4 As regards the two compounds hexadeca-anilino-H<sub>2</sub>Pc and hexadeca(ethylamino)H<sub>2</sub>Pc disclosed in D7, they are taken into account for deciding on inventive step although the proprietor (appellant) unsuccessfully tried to reproduce them (point 6.2.2, above). If, on the other hand, one took the position that these compounds were a non-enabling disclosure, Claim 1 of the 4<sup>th</sup> auxiliary request would have to be refused for lack of sufficiency of disclosure since it would then cover variants which cannot be produced, namely these two compounds. In such a case, any discussion of inventive step of the 4<sup>th</sup> auxiliary request would be superfluous.
- 6.6 Claim 1 of the 4<sup>th</sup> auxiliary request being not allowable, the 4<sup>th</sup> auxiliary request has to be refused.

## 7. *5<sup>th</sup> auxiliary request*

### 7.1 Amendments

- 7.1.1 Claim 1 of the 5<sup>th</sup> auxiliary request corresponds to Claim 1 of the 4<sup>th</sup> auxiliary request, except that "OR<sup>2</sup>" has been deleted as a possibility for Z<sup>1</sup> to Z<sup>16</sup>. This further restriction is allowable with respect to Article 123(2) EPC since it does not result in singling out a particular combination of specific definitions (see point 6.1.3, above).

7.1.2 As regards the remaining claims, the board is satisfied that they meet the requirements of Article 123 EPC. However, since they are not relevant for this decision, they will not be considered in further detail.

7.2 No objections under Articles 83 and 54 EPC arise against the subject-matter of the 5<sup>th</sup> auxiliary request whereby the arguments given for the 4<sup>th</sup> auxiliary request in this context equally apply to this request.

7.3 Inventive step

The slightly more limited range of compounds covered by Claim 1 of the 5<sup>th</sup> auxiliary request do not show any improvement over the compounds covered by the 4<sup>th</sup> auxiliary request or D1, respectively. For example, in Run 7 of Experimental Report D, the compound  $\text{SnCl}_2\text{Pc}(\text{PhNH})_4\text{F}_{12}$  does not contain an  $\text{OR}^2$  substituent (ie is covered by Claim 1 of the 5<sup>th</sup> auxiliary request) yet still displays a very poor  $T_v/T_e$  ratio.

Even hexadeca-anilino- $\text{H}_2\text{Pc}$  and hexadeca(ethylamino) $\text{H}_2\text{Pc}$  referred to in point 6.5.2, above, still fall within the definition of amended Claim 1.

Accordingly, the subject-matter of Claim 1 is obvious for the same reasons as given for the 4<sup>th</sup> auxiliary request.

7.4 Claim 1 of the 5<sup>th</sup> auxiliary request being not allowable, the 5<sup>th</sup> auxiliary request has to be refused.

8. 6<sup>th</sup> auxiliary request

8.1 Amendments

8.1.1 Claim 1 of the 6<sup>th</sup> auxiliary request (point IX(g), above) requires that the phthalocyanine compound is chosen from:  $\text{Pc}(\text{NHY})_8\text{X}_8$ ,  $\text{Pc}(\text{NHY})_4\text{X}_{12}$ ,  $\text{Pc}(\text{NHY})_8(\text{OR}^2)_8$ ,  $\text{Pc}(\text{NHY})_4(\text{OR}^2)_{12}$ ,  $\text{Pc}(\text{NHY})_8\text{H}_8$ ,  $\text{Pc}(\text{NHY})_4\text{H}_{12}$ ,  $\text{Pc}(\text{NHY})_8(\text{SR}^1)_8$ ,  $\text{Pc}(\text{NHY})_4(\text{SR}^1)_{12}$ , where Pc represents the whole of general formula I apart from  $\text{Z}^1$  to  $\text{Z}^{16}$  and X = halogen. The formulae for these compounds are supported by the formulae appearing in the heading for Group 1 to 8 type compounds listed in the patent in suit and the application as originally filed, respectively. The formulae in these headings do not specify the positions of the substituents. Only the specific examples of Group 1 to 8 identify the position of the substituents but not the headings themselves. Thus, the opponent's objection that there is no basis in the description for claiming these compounds without further defining the positions of the substituents of the phthalocyanine nucleus is not convincing.

Consequently, Claim 1 of the 6<sup>th</sup> auxiliary request meets the requirements of Article 123(2) EPC.

8.1.2 As regards the remaining claims, the board is satisfied that they meet the requirements of Article 123 EPC. However, since they are not relevant for this decision, they will not be considered in further detail.

8.2 No objections under Articles 83 and 54 EPC arise against the subject-matter of the 6<sup>th</sup> auxiliary request whereby the arguments given for the 4<sup>th</sup> auxiliary request in this context equally apply to this request.

8.3 Inventive step

The further limitation of the phthalocyanine compounds in Claim 1 to Group 1 to 8 type compounds cannot improve the proprietor's (appellant's) position with respect to inventive step. The compound  $\text{SnCl}_2\text{Pc}(\text{PhNH})_4\text{F}_{12}$  in Run 7 of Experimental Report D, which shows a very poor  $T_v/T_e$  ratio, is still within the scope of amended Claim 1 so that an improvement with regard to the  $T_v/T_e$  ratio over the whole range claimed cannot be acknowledged.

Furthermore, D7 identifies octa(ethylamino) $\text{H}_2\text{Pc}$  (column 3, line 48), a compound which falls within the scope of amended Claim 1.

Therefore, the subject-matter of Claim 1 is obvious over D1 and D7 for the same reasons as given for the 4<sup>th</sup> auxiliary request.

8.4 Claim 1 of the 6<sup>th</sup> auxiliary request being not allowable, the 6<sup>th</sup> auxiliary request has to be refused.

9. *7<sup>th</sup> auxiliary request*

9.1 According to Claim 1 of the 7<sup>th</sup> auxiliary request (point IX(h), above), the phthalocyanine compound is *inter alia* a compound of the formula  $\text{Pc}(\text{NHY})_4\text{F}_{12}$ . However, the patent in suit and the application as

originally filed, respectively, does not contain a reference to a formula  $\text{Pc}(\text{NHY})_4\text{F}_{12}$ .

9.1.1 In the general formula  $\text{Pc}(\text{NHY})_4\text{X}_{12}$  appearing in the heading of the Group 2 type phthalocyanine compounds (page 5, line 47 of the patent in suit and page 9, line 33 of the application as filed, respectively), X stands for halogen but not specifically for fluorine. Consequently, this formula is not a proper basis for phthalocyanine compounds of the formula  $\text{Pc}(\text{NHY})_4\text{F}_{12}$ .

9.1.2 As regards the formulae  $\text{Pc}(\text{PhNH})_4\text{F}_{12}$ ,  $\text{Pc}(\text{BuNH})_4\text{F}_{12}$ ,  $\text{Pc}(\text{OctNH})_4\text{F}_{12}$ ,  $\text{Pc}(\text{p-TolNH})_4\text{F}_{12}$ ,  $\text{Pc}(\text{o-Me-OPhNH})_4\text{F}_{12}$  and  $\text{Pc}(\text{p-FPhNH})_4\text{F}_{12}$  appearing amongst the Group 2 type phthalocyanine compounds listed on pages 5 and 6 of the patent in suit (pages 9 and 10 of the application as originally filed), it is conspicuous to the board that these formulae (i) identify specific NHY groups and (ii) are merely abbreviations for phthalocyanine compounds where the NHY and the fluorine substituents are arranged in very specific positions on the phthalocyanine nucleus. For example,  $\text{Pc}(\text{PhNH})_4\text{F}_{12}$  represents 4-tetrakis(anilino)-3,5,6-dodecafluoro-phthalocyanine.

Thus, apart from the question as to whether or not it is allowable to generalise specific NHY groups, in not restricting the substituents to any particular phthalocyanine positions, the formulae disclosed on pages 5 and 6 of the patent in suit are also not a proper basis for phthalocyanine compounds of the formula  $\text{Pc}(\text{NHY})_4\text{F}_{12}$ .



9.2 It follows from the above that Claim 1 of the 7<sup>th</sup> auxiliary request adds subject-matter contrary to Article 123(2) EPC. Hence, the 7<sup>th</sup> auxiliary request has to be refused.

10. *8<sup>th</sup> auxiliary request*

Similar considerations apply to the 8<sup>th</sup> auxiliary request since Claim 1 of this request (point IX(i), above) also refers to phthalocyanine compounds of the formula  $Pc(NHY)_4F_{12}$ . Thus, Claim 1 not meeting the requirements of Article 123(2) EPC, the 8<sup>th</sup> auxiliary request is refused.

11. *9<sup>th</sup> auxiliary request*

11.1 Amendments

11.1.1 Claim 1 of the 9<sup>th</sup> auxiliary request (point IX(j), above) requires that the phthalocyanine compound is chosen from:  $Pc(NHY)_8X_8$ ,  $Pc(NHY)_4X_{12}$ ,  $Pc(NHY)_8(OR^2)_8$  and  $Pc(NHY)_4(OR^2)_{12}$ , where Pc represents the whole of general formula I apart from  $Z^1$  to  $Z^{16}$  and X = halogen. The formulae for these compounds are supported by the formulae appearing in the heading for Group 1 to 4 type compounds listed in the patent in suit and the application as originally filed, respectively. In this context, reference is made to point 8.1.1, above.

Consequently, Claim 1 of the 9<sup>th</sup> auxiliary request meets the requirements of Article 123(2) EPC.

11.1.2 As regards the remaining claims, the board is satisfied that they meet the requirements of Article 123 EPC. However, since they are not relevant for this decision, they will not be considered in further detail.

11.2 No objections under Articles 83 and 54 EPC arise against the subject-matter of the 9<sup>th</sup> auxiliary request whereby the arguments given for the 4<sup>th</sup> auxiliary request equally apply to this request.

11.3 Inventive step

11.3.1 The further limitation of the phthalocyanine compounds in Claim 1 to Group 1 to 4 type compounds cannot improve the proprietor's (appellant's) position with respect to inventive step. The compound  $\text{SnCl}_2\text{Pc}(\text{PhNH})_4\text{F}_{12}$  in Run 7 of Experimental Report D, which shows a very poor  $T_v/T_e$  ratio, is still within the scope of amended Claim 1 so that an improvement with regard to the  $T_v/T_e$  ratio over the whole range claimed cannot be acknowledged.

Although the further restriction in Claim 1 avoids compounds explicitly disclosed in D7, the compounds required in Claim 1 still overlap with the general teaching of D7. Thus, a phthalocyanine compound of the formula  $\text{Pc}(\text{NHY})_8\text{X}_8$  falls within the general formula given in column 1 of D7. A person skilled in the art faced with the objective technical problem of providing further methods for providing heat radiation shielding materials would still arbitrarily select a compound covered by the general teaching of D7, thereby arriving inevitably at a compound meeting the definition of Claim 1 of the 9<sup>th</sup> auxiliary request.

11.3.2 The mere fact that amended Claim 1 does not cover any further compounds which are explicitly disclosed in D7 cannot confer inventiveness on the compounds now selected for use in the method according to Claim 1. The general teaching of D7 covers an admittedly huge but nevertheless finite number of phthalocyanine compounds, all of these compounds having a specific substitution pattern in the phthalocyanine nucleus. Furthermore, all compounds are said to be equally suitable for the same purpose which makes all of them a *priori* candidates for the skilled person trying to solve the objective technical problem. If compounds selected from the generality of D7 do not show an effect over the remaining compounds, such a selection is arbitrary and does not involve an inventive step.

11.3.3 Also the proprietor's (appellant's) argument that D7 is a non-enabling disclosure because some of the compounds of D7 could not be used in view of their instability is not convincing. Firstly, it is doubtful whether or not D7 is a non-enabling disclosure at all (point 6.2.2, above). Secondly, even if some of the compounds covered by D7 could not be made, it has not been shown that an occasional lack of success invalidates the whole general teaching of D7.

11.4 Claim 1 of the 9<sup>th</sup> auxiliary request being not allowable, the 9<sup>th</sup> auxiliary request has to be refused.

**Order**

**For these reasons it is decided that:**

The appeal is dismissed.

The Registrar:

The Chairman:

E. Görgmaier

R. Young