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**Datasheet for the decision  
of 15 June 2007**

**Case Number:** T 0648/04 - 3.3.06

**Application Number:** 96306906.7

**Publication Number:** 0779341

**IPC:** C09C 1/00

**Language of the proceedings:** EN

**Title of invention:**

Pellets comprising pigment dispersed in an ethylene-vinyl acetate polymer

**Patentee:**

Rockwood Pigments (UK) Limited

**Opponent:**

Dr. Hans Heubach GmbH und Co. KG  
Clariant Verwaltungsgesellschaft mbH

**Headword:**

Rigid PVC/ROCKWOOD

**Relevant legal provisions:**

EPC R. 29(1), 35(12)

EPC Art. 56, 84, 123

**Keyword:**

"Clarity (yes): terms having well recognised meaning in the field of rigid PVC manufacturing processes"

"Inventive step (yes): Prior public use (not proved); ex post facto analysis (not acceptable)"

**Decisions cited:**

T 0337/95, G 0002/88

**Catchword:**

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Case Number: T 0648/04 - 3.3.06

**D E C I S I O N**  
of the Technical Board of Appeal 3.3.06  
of 15 June 2007

**Appellant:** Rockwood Pigments (UK) Limited  
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**Decision under appeal:** Decision of the Opposition Division of the European Patent Office posted 16 April 2004 revoking European Patent No. 0779341 pursuant to Article 102(1) EPC.

**Composition of the Board:**

**Chairman:** P.-P. Bracke  
**Members:** G. Raths  
U. Tronser

## Summary of Facts and Submissions

- I. This appeal is from the Opposition Division's decision to revoke European patent No. 0 779 341 relating to pellets comprising pigment dispersed in an ethylene-vinyl acetate polymer.
- II. The patent as granted and the application as originally filed contained 14 claims of which claims 1, 7 and 13 read as follows:
- "1. Colour concentrate pellets for pigmenting polyvinyl chloride, which pellets are substantially all of diameter 0,1-3 mm and which pellets comprise pigment dispersed in a carrier comprising ethylene-vinyl acetate polymer which is ethylene-vinyl acetate copolymer and/or alloy thereof with polyethylene, the polymer having a vinyl acetate content of 13-28% by weight and a melt flow index (as measured by the method of ASTM D 1238 using a 2,16 kg weight at 190°C) of 3.5-150 g/10 minutes, the pellets comprising at least 30% by weight of the pigment and at least 10% by weight of the polymer."
- "7. Pellets according to anyone of the preceding claims which are free from wax."
- "13. Polyvinyl chloride pigmented by having been co-melted with pellets claimed in any one of claims 1-8."
- III. Two notices of opposition to the European granted were given in accordance with Article 99(1) EPC.

Both opponents based their opposition on lack of novelty and inventive step (Articles 100 (a), 54 and 56 EPC).

Inter alia, the following documents were filed during the opposition proceedings:

- (2) US-A-5 176 751;
- (3) Miravithen<sup>®</sup> D23 EA;
- (11) DD-A-269 297;
- (12) Ullmann's Encyclopedia of Technical Chemistry", 6. Auflage, Digital edition 2003, section "Waxes;
- (P6a) Graph of % VA vs. Time to gel
- (P6b) Graph Micrafo Addition vs. Charpy impact strength;
- (E1a) Lieferprogramm für die Druckfarben-, Lack-, Kunststoff-Industrie und Spezialgebiete, Hoechst High Chem Pigment;
- (E1b) Kunststoff Hoechst Pigmente MPR Nr. 2/89 Lemler Kreuzer;
- (E1c) Produktionsauftrag RENOL-SCHWARZ P-IK;
- (E1d) Produktionsauftrag RENOL ROT BSR-IK;
- (E1e) Liefersortiment "Greenflex MQ 40" von Enichem Deutschland AG (3.3.93) and
- (E1f) Produktionsauftrag Renol-Rot IKV 20084, Hoechst AG.

IV. In its decision the Opposition Division held that the subject-matter of Claim 1 of the then pending main request lacked clarity (Article 84 EPC) and that of Claim 1 of the then pending auxiliary request did not involve an inventive step (Article 56 EPC), both

- requests having been submitted under cover of the letter of 26 January 2004. The reasoning regarding inventive step was based on a prior public use.
- V. The appellant (proprietor of the patent) filed an appeal against this decision.
- VI. As to the prior public use opponent 02 (hereinafter respondent II) submitted further evidence in form of the following documents under cover of the letter dated 10 December 2004:

- (E1f1) Rechnung Hoechst/Kerpenwerk  
vom 30. August 1993
- (E1f2) Rechnung Hoechst/Kerpenwerk  
vom 9. November 1993
- (E1g) Coloration of PVC and other plastics with  
organic pigments
- (E1h) supplying data: 1993-96

- VII. Under cover of the letter dated 13 April 2007 the appellant submitted a main request, a first auxiliary request and a second auxiliary request.

- VIII. Claim 1 of the main request reads:

"1. Rigid PVC pigmented by having been co-melted with polyvinyl chloride pigmenting colour concentrate pellets, which pellets are free of wax, are non-friable, are all of diameter 0.1-3 mm and which pellets comprise pigment dispersed in a polymeric carrier comprising an ethylene-vinyl acetate polymer and which is ethylene-vinyl acetate copolymer and/or alloy thereof with polyethylene, the polymer having a vinyl acetate

content of about 18% by weight, a melt flow index (as measured by the method of ASTM D 1238 using a 2.16 kg weight at 190°C) of 3.5-25 g/10 minutes and a number average molecular weight of 10000-40000, and which polymer is not waxy, the pellets comprising at least 30% by weight of the pigment and at least 10% by weight of the polymer, and which pellets optionally contains one or more additives."

Dependent claims 2 to 6 represent particular embodiments of Claim 1.

IX. Oral proceedings took place on 15 June 2007.

1. The appellant submitted in essence the following arguments:

The Opposition Division did not appreciate correctly the alleged prior public use regarding "Renol-Rot IKV 20084" by Opponent II. Opponent II did not prove its case up to the hilt.

Pellets according to the main request would show technical advantages when used for rigid PVC which had improved impact strength. The customer of "Renol-Rot IKV" was Kerpenwerk GmbH which needed a plasticised PVC whereas the technical requirements for rigid PVC would be different.

Starting from the alleged prior public use of Renol products sold by HOECHST to Kerpenwerk, the appellant argued that document (E1a) disclosed a pigment composition on the basis of EVA **and wax** as a carrier for colouring PVC. There was no evidence to use the

product in form of pellets and to use the Renol product in rigid PVC, since the cables manufactured by Kerpenwerk were made of soft PVC. No information was available of the impact strength of rigid PVC pigmented with pellets comprising pigment dispersed in a polymeric carrier comprising ethylene-vinyl acetate (EVA) having a vinyl acetate (abbreviated by "VA") content of about 18%.

Starting from document (11) as closest prior art, the appellant argued that this document disclosed an EVA having a melt flow index of  $MFi_{49/190}$  of 3 to 20 g/10 min whereas the melt flow index of the polymer according to the patent in suit was 3.5 to 25 g/10 min but measured according to ASTM D1238 using 2.16 kg weight at 190°C. Hence these melt flow data were not comparable.

2. Opponents 1 and 2, hereinafter respondents I and II, argued in essence, in writing and orally, that the claimed subject-matter would contravene Article 84 EPC since the terms "rigid", "free of wax", "non-friable", "about 18%", "non-waxy" and "the concentrations of the pigment and polymer" would not be clear.

In regard of inventive step, the respondents argued by referring once to the alleged prior public use and once to patent literature, namely document (11).

As to the alleged prior public use, document (E1a) disclosed Renol IK/HK products, i.e. carrier compositions comprising EVA copolymers and wax, which according to document (E1e) would comprise EVA copolymers having a vinyl acetate of 19%. Document (E1b) would also have praised Renol products as suitable for



injection moulded PVC i.e. rigid PVC. Since "Renol Rot IKV 20084" was sold to Kerpenwerk, which manufactured PVC cables, it would have been obvious for the skilled person to pigment rigid PVC with a carrier comprising a pigment and EVA having a vinyl content of 18%.

If the skilled person considered document (11) as the closest prior art, he would have learnt to use a carrier comprising EVA having a melt flow index of 3 to 30 g/10 min and a pigment to colour injection moulded PVC, i.e. rigid PVC.

Further, since document (3) disclosed that Miraviten<sup>®</sup>, an EVA copolymer, was available as a polymer having 13% VA and 23% VA by weight, the skilled person would certainly perform a test at the middle value of the two extremes i.e. 18% VA content, and find that the impact strength would be improved.

- X. The appellant requested that the decision under appeal be set aside and that the patent be maintained on the basis of the main request or one of the first or second auxiliary requests submitted under cover of the letter dated 13 April 2007.

The respondent requested that the appeal be dismissed.

## Reasons for the Decision

### Main request

1. *Admissibility in view of Article 123 EPC*

- (a) The Board is satisfied that the requirements of Article 123(2) EPC are met. In particular, Claim 1 is a combination of original claim 1 and the disclosure in the application as filed (page 11, line 13; claim 13; claim 7; page 5, line 2; page 6, line 11; page 6, line 2; claim 2; page 4 line 22; page 7 line 16).

Also, the subject-matter of Claims 2 to 6 find its support in the application as filed (page 6, line 4; Claim 3; page 6, line 22; page 11, line 9 and claim 14)

Since this was not contested by the respondents, it is not necessary to give detailed comments.

- (b) The Board is further satisfied that the claims have not been amended in a way that extends the protection conferred (Article 123(3) EPC). This finding also was not contested and, thus, no further reasons have to be given.

Consequently, the subject-matter of Claims 1 to 6 meets the requirements of Article 123 (2) and (3) EPC.

2. *Article 84 EPC*

2.1 Article 84 EPC in combination with Rule 29(1) EPC stipulates the requirements that the claims shall be clear and define the matter for which protection is sought in terms of the technical features of the invention.

In the context of Article 84 EPC, the meaning of a term or expression used in a feature of a claim depends in particular on the definition thereof generally accepted by those skilled in the relevant art, as established in Rule 35(12), last sentence, EPC requiring in general that use should be made of "the technical terms... generally accepted in the field in question", here rigid PVC manufacturing processes.

2.2 The Board draws the attention to the fact that terms like "rigid", "non-friable" and "not waxy" are usually not allowed since they are relative terms and, therefore, unclear, and as such they cannot be used to delimit the subject-matter claimed from the prior art thereby giving rise to uncertainty as to whether or not the subject-matter claimed is anticipated. Also, the word "about" can not be used if it does not prevent an unambiguous distinction from the prior art. The context in which these terms are used here needs therefore closer examination.

2.3 Claim 1 is directed to rigid PVC pigmented by having been co-melted with PVC pigmentsing colour concentrate pellets.

2.4 The respondents objected that the term "rigid" was not clear because "rigid" could imply "semi-rigid"; further "a rigid PVC" could mean that "up to 12%" of a softening agent could be present, and a content of "10 to 12% of softening agent" would cast doubts on the precise meaning of "rigid".

However, the Board observes that the patent in suit defines implicitly "rigid PVC" by its manufacturing method, namely injection moulding (column 6, lines 26 to 28). It was known in the art that injection moulding produces "rigid PVC" (see document E1b, page 3, line 5). Attention is also drawn to document (2) disclosing the expression "PVC (flexible and rigid)" (column 8, line 23), thus differentiating between these types of PVC without further explanations which is a hint that the skilled person is aware of the different meanings of "flexible" and "rigid" PVC.

Therefore, in this case, "rigid PVC" has a well recognised meaning in the particular field.

2.5 The respondents by referring to document (12) objected that the wording "free of wax" was not clear because

"no generally accepted definition would exist for the term wax." (document (12), 1.2 definition, first sentence).

For the Board, the term "wax" is to be interpreted in the context of the patent in suit. The Board observes in passing that the year of publication of document (12) is 2003 (copyright © 2002, article online posting date June 15, 2000) whereas the priority date of the patent

in suit is 1 December 1995. As the respondents relied on document (12), the Board draws the attention to the last sentence of paragraph 3 of the section called "1.2 definition" of this document where it is stated that "waxes can be classified according to their applications".

According to the patent in suit, a wax is used for easier dispersion in the PVC (column 1, lines 18 to 20). The term "wax" has a well recognised meaning in the particular art since document (E1a) discloses carriers on the basis of EVA and wax (page 52, section 5.4, lines 1 to 2). It is inferred from the absence of any further explanations as to the kind of wax to be used according to document (E1a) that the skilled person knows what "wax" he should use. So, the term "wax" has a sufficiently precise and well recognized meaning in the particular field of compounding rigid PVC and, in this case, does not require further explanations.

- 2.6 The respondents objected that the term "non-friable" would not be clear since it would have a descriptive function deprived of a clear technical meaning.

For the Board, again the patent in suit offers a definition by referring to document (2) cited in the patent in suit (column 2, lines 49 to 57):

"The pellets of this reference [*i.e.* document (2)] are friable; it is very much preferred that the present pellets be not friable so that they are more abrasion resistant and do not become dusty, e.g., during use or transport."

This statement in the patent in suit is corroborated by the following passages of document (2) explicitly stating that

"[i]t is also an object of the invention to produce a color concentrate pellet that is friable..." (column 2, lines 33 to 34).

"The pellets are "cold-pressed" or "cold-formed" which...means mechanically pressed or compacted without applying substantial external heat, and without melting the mass of the material to form a cohesive and united body. When pellets are formed in a pellet mill as described herein, the pellets are friable." (column 6, lines 39 to 45).

The characteristics "friable" and "non friable" are not mere relative terms or adjectives having a descriptive function but are seen in the technical context of the manufacturing processing thereof, and also of the chemical composition of the pellets, as shown below.

As regards this chemical composition, according to Claim 1 the pellets comprise pigment dispersed in a carrier. The carrier comprises an ethylene-vinyl acetate polymer having a molecular weight of 10000 to 40000 (see Claim 1 and column 3, line 34), which is **not** waxy (column 2, lines 49 to 50). In claim 1 the non waxy EVA copolymer is further defined by its VA content of about 18% and its melt flow index of 3.5 to 25 g/10 minutes (column 3, line 31 and line 43). This contrasts with the carrier used according to document (2) which is a mixture of a bis-stearamide wax and a low

molecular weight (i.e. about 3000), waxy ethylene-vinyl acetate copolymer (column 8, lines 60 to 63). The pellets of document (2) are friable. The patent in suit cites this reference and summarizes the relevant contents in column 2 (lines 51 to 57).

Further, during oral proceedings the appellant explained that the compounding of the product is a function of the end-use and allows to incorporate additives, such as antioxidants or UV absorbers (patent in suit, column 4, lines 24 and 25) or to adjust the ratio of pigment to polymer in order to meet particular specifications of the customer, whereby the pellets comprise at least 30% by weight of pigment and at least 10% by weight of polymer.

In view of the above definitions of the pellets by way of their processing characteristics and their chemical composition, in this case, the terms "friable" and "non friable" have a well recognised meaning in the art of manufacturing pellets in the field of rigid PVC.

- 2.7 An objection of lack of clarity was directed against "about 18% by weight" because this wording would leave the reader in doubts as to the allowable limits of the boundary values.

The Board refers to the patent in suit where it is stated that in order to define the critical value of "about 18% by weight", it was found in the graph of gel time against vinyl acetate content that a dip occurs, so that the gel time of the polymers with contents from 13 to 28% is lower than that on either side of the

range, reaching a minimum at a content of about 18% (column 3, lines 37 to 43).

The Board observes that the assessment of the critical value of about 18% is made on a graph, not reproduced in the patent in suit but submitted during the opposition procedure as document (P6a). This graph shows several curves all of which converge at a common point called "dip" representing a minimum value for the time gel. The plotting of the graph does not allow to indicate the result accurately with the integer "18" and, thus, the expression "about 18" reflects the impossibility to indicate the result with the integer "18" and the necessity to indicate a small deviation from the integer "18", the tight boundaries of this deviation resulting from the method of determining the value on the graph, which consists in drawing a perpendicular to the x-axis (% vinyl acetate) through the lowest point of the graph to arrive at the intersection with the x-axis. In this case, the person skilled in the art knows how to interpret the qualitative result of "about 18" since he is aware of the fixing procedure of this value and the problems of accuracy. Therefore, in this case, the expression as well as its meaning is clear.

- 2.8 The objection of lack of clarity raised by the respondents against the term "non-waxy" was that it only has a descriptive function and is ambiguous because it is derived from the term "wax", which in turn would not be precisely defined.

The Board does not agree. In the patent in suit, it is referred to the ethylene-vinyl acetate copolymer



according to document (2) as a waxy ethylene-vinyl acetate copolymer having a low molecular weight (patent in suit, column 2, lines 49 to 53); in document (2) the low average molecular weight has been exemplified as being about 3000 (column 8, lines 61 to 63); by contrast, the ethylene-vinyl acetate copolymer according to the patent in suit, apart from being defined as having a vinyl acetate content of about 18% by weight and a melt flow index of 3.5 to 25 g/10 minutes, has a number average molecular weight of 10000-40000 so that the identification of the ethylene vinyl acetate copolymer as a non waxy one is unequivocal.

- 2.9 The respondents objected that the concentrations of at least 30% by weight of pigment and at least 10% by weight of polymer would leave the remaining portion of 60% not clearly defined. Further the pigment could comprise 30% to 100% of a pigmentary material, or, in other words, 70% of other components, for instance, are not defined.

The Board observes that according to the patent in suit the pellets usually contain 30 to 90%, generally 50 to 90%, preferably 60 to 90%, especially 70 to 85% of pigment (column 3, line 58 to column 4, line 2); further, it is said that the pellets contain enough carrier to carry the pigment. The carrier usually consists essentially of the ethylene-vinyl acetate polymer, though mixtures with other carrier materials can be employed. The pellets usually contain 10 to 50% of the polymer (patent in suit, column 4, lines 16 to 23).

The pigment should be thermally stable at temperatures above 140°C. The pigment itself is exemplified by titanium dioxide, lead chromate, lead molybdate, calcium carbonate, phtalocyanine blue or green, or carbon black, or a mixture of two or more of these (patent in suit, column 4, lines 10 to 15).

Further the pellets optionally contain one or more additives which according to the description may be stabilisers such as antioxidants or UV absorbers or a lubricant or a filler (column 4, lines 24 to 26, lines 44 and 45).

Since Claim 1 is directed to rigid PVC, the skilled person is aware that the compounding options are submitted to restrictions with respect to the end-product. The additives are limited to those which do not affect the rigid character of PVC.

In regard of the concentrations to be allowed for the pigment and the polymer, the patent in suit offers enough technical details. Claim 1 defines the minimum concentrations of pigment and polymer, i.e. at least 30% by weight and at least 10 % by weight, respectively. The indication of these concentrations essential for solving the technical problem is a necessary technical detail which is, in this case, sufficient for fulfilling the requirement of clarity.

- 2.10 The product is rigid PVC having improved impact strength (see point 4.3), rigid PVC implying an injection moulding process (see point 2.4). The Board, in this case, allows the above mentioned terms in the context of the field of PVC production since the

manufacturing process, i.e. injection moulding, dictates some conditions such as the use of non-friable pellets and of a non waxy copolymer. As shown herein above, in claim 1 the above mentioned terms are illustrated by technical features which give them their actual meaning.

The public is not left in any doubt as to which subject-matter is covered by claim 1 and which is not, since it allows unambiguously this distinction to be made (see decisions G 2/88, OJ EPO 1990, 93, point 2.5 of the reasons; T 337/95, OJ EPO 1996, 628, points 2.2 to 2.5 of the reasons). It follows that Claim 1 is clear in the sense of Article 84 EPC.

3. *Novelty*

No objection was raised in respect of novelty.

None of the documents submitted to prove the alleged prior public use disclosed the subject-matter of Claim 1. The same holds for patent literature. In particular, documents (2), (3) and (11) did not disclose a rigid PVC pigmented with pellets comprising an EVA copolymer having a VA content of about 18%, but free of wax.

The Board is satisfied that the subject-matter of Claim 1 and of dependent claims 2 to 6 meet the requirements of Article 54 EPC.

4. *Inventive step*

4.1 Whereas during opposition proceedings the claimed subject-matter under consideration was directed to polyvinyl chloride-pigmenting colour concentrate **pellets**, the subject-matter of Claim 1 of the main request is directed to **rigid PVC** pigmented with polyvinyl chloride-pigmenting colour concentrate pellets.

4.2 Claim 1 is directed to rigid PVC pigmented by having been co-melted with polyvinyl chloride pigmentation colour concentrate pellets, which pellets comprise pigment dispersed in a polymeric carrier comprising an ethylene-vinyl acetate polymer (see point IX).

4.3 According to the patent in suit, it was state of the art that the pigment for colouring PVC is dispersed in a carrier which is conventionally wax (column 1, lines 15 to 20).

However, pellets in which the carrier is a wax have various disadvantages. The wax tends to migrate through the PVC during processing and this can cause problems at its surface, for instance in terms of its gloss and the adhesion of the layer. Further, wax dispersions have a detrimental effect on the physical properties of the PVC such as its impact strength. The pellets tend to abrade during transport resulting in a dusty product, difficult in metering accurately the required amount to pigment the PVC and difficult in obtaining a uniform mixing with the PVC, the wax containing pellets being not of narrow size distribution.

Therefore, it would be desirable for the pellets to be of narrow size distribution, for ease of metering and for ease of mixing with the PVC in order to obtain a rigid PVC pigmented with improved colour concentrate pellets and improved impact strength (see column 1, lines 15 to 56 and column 2, lines 30 to 31).

- 4.4 The Appellant focused on the problem of improving impact strength of rigid PVC. This problem was solved by providing a rigid PVC according to Claim 1 which rigid PVC is pigmented by having co-melted with polyvinyl chloride-pigmenting colour concentrate pellets, which pellets comprise pigment dispersed in a polymeric carrier comprising an ethylene-vinyl acetate polymer having a vinyl-acetate content of about 18% by weight.
- 4.5 Document (P6b) showed a graph indicating the Charpy impact strength ( $\text{kJ/m}^2$ ) in function of the amount of PVC colouring pellets in %, the pellets comprising EVA having 6.5%, 13, 18 and 28% by weight of VA (abbreviated by "6.5, 13, 18 and 28% VA pellets"), respectively.
- 4.6 The "13 and 28 % VA pellets" were only used for two measurements of the impact strength, the one at 0% addition and the other at 2% addition.

In the range of 0.50% to 4.5% addition of pellets to rigid PVC, the "6.5% VA pellets" provided rigid PVC with an impact strength of about 10 to 11  $\text{kJ/m}^2$  ("6.5 % VA pellets", alloy obtained with low density polyethylene having a melt flow index of 40) and 15 to 17  $\text{kJ/m}^2$  ("6.5 % VA pellets", alloy with low density

polyethylene having a melt flow index of 20), respectively.

The impact strength of rigid PVC comprising pellets made of EVA having 18% VA shows the following:

At 0.50% addition of pellets to rigid PVC, the impact strength of rigid PVC reaches a maximum (56 kJ/m<sup>2</sup>) being superior to the impact strength obtained with "13% and 28% VA pellets" (44 kJ/m<sup>2</sup> and 36 kJ/m<sup>2</sup>); the impact strength remains the highest with "18% VA pellets" in the range of 0.50% to 1.43% pellets addition.

At 2% addition of pellets to PVC, the impact strength of rigid PVC made with "18% VA pellets" (36 kJ/m<sup>2</sup>) is below that of rigid PVC made with "28% VA pellets" (45 kJ/m<sup>2</sup>) but higher than that of rigid PVC made with "13% VA pellets" (15 kJ/m<sup>2</sup>).

In the range of 2% to 4.5% addition the impact strength of rigid PVC made with "18% VA pellets" is superior to that of rigid PVC made with "6.5 % VA pellets" (see also Appellant's letter dated 26 January 2004, page 6)

These results were not disavowed by counter evidence.

The Board is satisfied that the problem of improving the impact strength of rigid PVC obtained with pellets comprising EVA with about 18% by weight VA is credibly solved over the whole range of Claim 1.

The question is whether this technical solution involved an inventive step.

4.7 In accordance with the problem and solution approach the respondents when identifying the closest prior art took two different starting points: the first was the alleged prior public use of the subject-matter of claim 1 of the main request, the second was document (11).

Hence, the Board first evaluates the information available from the alleged prior public use.

4.8 Prior public use

4.8.1 Concerning the issue whether an invention has been made available to the public by prior use, the burden of proof lies with opponent 2/respondent II.

4.8.2 Document (E1a) discloses that the product Renol IK/HK is a pigment comprising ethylene-vinyl acetate to be used for colouring PVC and may be supplied in form of granules or pellets ("pellets" being the translation of the German word "Granulat") ("IK" standing for 2.5 x 3.5 mm) or micro-pellets ("HK" standing for 1 x 1.5 mm; document (E1b), page 1, lines 1 to 5)). The Renol product IK/HK according to document (E1a) is a pigment preparation on the basis of EVA **and wax**.

The Board discards document (E1a) because the rigid PVC according to Claim 1 is pigmented with pellets **free of wax**.

- Document (E1b) does not list "Renol Rot IKV 20084"; the other Renol Rot products mentioned in this document had label affixes like HG-IK, HB-IK which are of no relevance to this case.

Document (E1b) is therefore disregarded.

- Document (E1c) is a production request for manufacturing "RENOL-SCHWARZ P-CK" identified on the second page as "RENOL-SCHWARZ P-IK". The manufacturing process involved mixing in a granulator Greenflex MQ 40 (EVA having a VA content of 19%, see document (E1e), Spritzguss), carbon black (pigment) and wax.

The Board discards this document because the process involved wax whereas rigid PVC according to Claim 1 is co-melted with pellets which are free of wax.

- The Board discards document (E1d), a production request of "RENOL ROT BSR-IK" because no evidence was submitted that the product obtained was used to pigment rigid PVC.
- Document (E1f) is a production request directed to a manufacturing process involving the mixing in a granulator of "Renol-Rot IKV 20084" (sample 303867), of Greenflex MQ 40 and PV-Carmin HF3C, the customer being Kerpenwerk. The production request (according to document (E1f)) identifies the customer appointment date (2 June 1993), the customer (Kerpenwerk GmbH), the product ("Renol-Rot IKV 20084"), the sample (304957), the raw materials and their amounts i.e. PV Carmin HF3C (225.00 kg), Greenflex MQ 40 (337.50 kg) and RENOL ROT IKV 20084 (142.70 kg), the operator (identification number 022), the production date 23 June 1993 as well as the operator responsible



for the manufacturing process (ID n° 346) and the operator for sieving (ID n° 104). Document (Elf) discloses that "Renol-Rot IKV 20084" is processed in a granulator together with GREENFLEX MQ40.

- Document (Elh) with the heading Renol Rot IKV 20084 (sample 304957) identifies the customer as Kerpenwerk; a table displays the shipment of "Renol-Rot IKV 20084", the amounts and the respective shipment dates.

Documents (Elf1) and (Ef2) prove the delivery of "Renol-Rot IKV 20084" (sample N° 304957) to Kerpenwerk which is a manufacturer of cable. This is only a proof that Renol-Rot IKV 20084 had been sent to Kerpenwerk.

However it cannot be inferred from documents (Elf), (Elf1), (Elf2) and (Elh) that Kerpenwerk manufactured **rigid** PVC pigmented with said "Renol-Rot IKV 20084".

- The Board discards document (Elg), which unequivocally discloses the identity between "PV Carmin HF3C" and "C.I. Pigment Red 176", because no link to the use of this pigment in rigid PVC could be established.
- According to respondent II, the letter "V" in the affix "IKV" designating the trial period ("Versuchszeit") was dropped when the product was ready for commercialization, but evidence establishing a link that the product compounding remained the same is missing.

Therefore, no unambiguous link can be established between document (E1a) disclosing Renol IK/HK and (E1f) disclosing "Renol-ROT IKV 20084".

The appellant did not contest that RENOL products were sold to Kerpenwerk but disputed that "RENOL Rot IKV 20084" was used by Kerpenwerk to pigment rigid PVC.

- 4.9 In view of the gaps in the chain of commercial transactions, respondent II does not succeed on this ground. Respondent II has failed to evidence that rigid PVC was pigmented with pellets comprising EVA having a VA content of about 18%, but free of wax. For the above reasons the documentary evidence submitted by respondent II is insufficiently cogent and convincing to support its allegation that rigid PVC was manufactured by Kerpenwerk with pellets comprising EVA with about 18% by weight VA, but free of wax.

Furthermore, as a passing remark, since no data on impact strength or any other physical properties were disclosed, a further uncertainty would have remained as to whether this characteristic was a property made available to the public by the mere delivery of the end-product, i.e. rigid PVC, a delivery which here is only mentioned as an hypothesis.

The Board concludes that there is no evidence for the colouring of rigid PVC with pellets, let alone pellets comprising a pigment, let alone pellets comprising a pigment and EVA, but no wax.

- 4.10 The second line of arguments referred to patent literature.
- 4.11 Colouring PVC, in particular rigid PVC, with a colour concentrate comprising a carrier and a pigment, the carrier being an ethylene-vinyl acetate copolymer was known from document (11) which was also taken as a suitable starting point by respondents I and II for assessing inventive step.

The claimed subject-matter differs from that of document (11) in that

- the melt flow index  $MFI_{49/190}$  of the EVA copolymer was 3 to 30 g/10 min measured with 49 kg m/s<sup>2</sup> at 190 °C whereas according to the patent in suit the melt flow index of the EVA copolymer was 3.5 to 25 g/10 min measured by the method of ASTM D 1238 using a 2,16 kg (kilopond) at 190°C. Since the 49 kg m/s<sup>2</sup> correspond to 5 kg (kilopond), the weight used according to the method of document (11) was more than twice higher than that according to the ASTM method of the patent in suit. Hence the range of 3 to 30 g/10 min (according to document (11)) is not comparable to the range of 3.5 to 25 g/10 min (according to the patent in suit).
- the concentration of the VA content is missing in document (11). Hence there was no pointer for the skilled person to use an EVA copolymer having 18% by weight of VA.

The question is whether he could have got a hint in documents (2) or (3).

- a) Document (2) discloses the use of an EVA copolymer having a VA content of about 13% (column 8, line 62) and it is believed that a VA content of 12 to 16 % would also work (column 8, lines 65 and 66). However the pellets according to document (2) are manufactured with wax and should be friable (column 4, lines 55 to 58; column 6, line 51).

Therefore document (2) does not give a pointer to the skilled person to replace the wax with an EVA copolymer having a VA content of about 18%.

- b) Document (3) discloses two EVA copolymer types, namely Miravithen® D23A and Miravithen® 37 XA, having VA contents of 13% and 23%, respectively, suitable for injection moulding. The respondents argued that in the light of the disclosure of two different VA contents, namely 13 and 23% by weight, the skilled person would try an EVA copolymer having a VA content equal to the average of both copolymers, namely 18%.

The Board notes that document (3) did not point to an EVA copolymer having a VA content of about 18% or to tests to be made with a VA content equal to the average of the values disclosed. Therefore, the Board does not accept the appellants' reasoning which is speculative and ex post facto.

4.12 It follows that the subject-matter of Claim 1 and, thus, of the dependent claims 2 to 6, involves an inventive

step, and, therefore, meets the requirements of Article 56 EPC.

Auxiliary requests

In the light of the above findings, there is no need to consider the auxiliary requests.

**Order**

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

The decision under appeal is set aside.

The case is remitted to the department of first instance with the order to maintain the patent on the basis of the main request submitted under cover of the letter dated 13 April 2007 and the description to be adapted.

The Registrar:

The Chairman:

G. Rauh

P.-P. Bracke