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**Datasheet for the decision
of 24 March 2010**

Case Number: T 1252/07 - 3.3.03

Application Number: 99914266.4

Publication Number: 1080147

IPC: C08K 5/00

Language of the proceedings: EN

Title of invention:

Methods and compositions for protecting polymers from UV light

Patentee:

CYTEC TECHNOLOGY CORP.

Opponent:

BASF Specialty Chemicals Holding GmbH

Headword:

-

Relevant legal provisions:

EPC Art. 54, 56, 100(c), 123(2)

Relevant legal provisions (EPC 1973):

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Keyword:

"Amendment in the sense of G 9/91, point 19 of the reasons
(no)"

"Main request: novelty (yes)"

"Main request: inventive step (yes)"

Decisions cited:

G 0009/91, T 0035/85, T 0197/86, T 0375/91, T 1002/92,
T 0065/96, T 0941/98, T 0381/02, T 0235/04, T 1042/06

Catchword:

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Case Number: T 1252/07 - 3.3.03

D E C I S I O N
of the Technical Board of Appeal 3.3.03
of 24 March 2010

Appellant: BASF Specialty Chemicals Holding GmbH
(Opponent) Klybeckstrasse 141
CH-4057 Basel (CH)

Representative: Richter, Helmut
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Respondent: CYTEC TECHNOLOGY CORP.
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Decision under appeal: Interlocutory decision of the Opposition
Division of the European Patent Office dated
9 May 2007 and posted 25 June 2007 concerning
maintenance of the European patent No. 1080147
in amended form.

Composition of the Board:

Chairman: R. Young
Members: O. Dury
C.-P. Brandt

Summary of Facts and Submissions

- I. The mention of the grant of European patent No. EP-B-1080147, based on application 99914266.4, filed on 30 March 1999 in the name of Cytec Technology Corp. was published on 10 November 2004 in Bulletin 2004/46.
- II. In this decision, any reference to passages in the patent in suit as granted will be given underlined in squared brackets, e.g. [Claim 1]. References in underlined italics concern passages in the application as originally filed, e.g. *Claim 1*.
- III. The granted patent was based on 22 claims, wherein [claim 1] read as follows:

"1. A polymeric article, comprising a polymeric material from 50 to 5,000 ppm of at least one ortho-hydroxy tris-aryl triazine light absorber (triazine), and from 500 ppm to 1.25 percent of at least one oligomeric, polymeric, or high molecular weight HALS having a molecular weight of at least 500, wherein the weight ratio of HALS to triazine is from 3:1 to 20:1, and wherein the polymeric article is a molded article, an extruded article, or a biaxially oriented tape or film."

[Claims 2-18] were dependent claims directed to elaborations of the article of [claim 1]. In particular, [claim 6] and [claim 13] read as follows:

"6. The polymeric article of any one of claims 1 to 3, wherein the HALS is selected from the group consisting of:

Bis(1-octyloxy-2,2,6,6-tetramethyl-4-piperidinyl)
sebacate;

dimethyl succinate, polymer with 4-hydroxy-2,2,6,6-
tetramethyl-1-piperidineethanol;

a blend of dimethyl succinate, polymer with 4-hydroxy-
2,2,6,6-tetramethyl-1-piperidineethanol and N,N'-
bis(2,2,6,6-tetramethyl-4-piperidinyl)-1,6-hexane
diamine polymer with 2,4,6-trichloro-1,3,5-triazine,
reaction products with 2,4,4-triethyl-2-pentanamine;

1,3,5-triazine-2,4,6-triamine, N,N''[1,2-
ethanediylbis[[[4,6-bis[butyl(1,2,2,6,6-pentamethyl-4-
piperidinyl)amino]-1,3, 5-triazine-2-yl]imino]-3,1-
propanediyl]]-bis[N',N''-dibutyl-N',N''-bis(1,2,2,6,6-
pentamethyl-4-piperidinyl)]-;

1,3,5-triazine-2,4,6-triamine, N,N''[1,2-
ethanediylbis[[[4,6-bis[butyl(1-cyclohexyloxy-2,2,6,6-
tetraamethyl-4-piperidinyl)amino]-1,3,5-triazine-2-
yl]imino]-3,1-propanediyl]]-bis[N',N''-dibutyl- N',N''-
bis(1,2,2,6,6-pentamethyl-4-piperidinyl)]-;

N,N'-bis(2,2,6,6-tetramethyl-4-piperidinyl)-1,6-
hexanediamine, polymer with 2,4,6-trichloro-1,3,5-
triazine, reaction products with 2,4,4-trimethyl-2-
pentanamine;

poly[methylpropyl-3-oxy-(2',2',6',6'-tetramethyl-4'-
piperidinyl)] siloxane;

poly[methylpropyl-3-oxy-(1',2',2',6',6'-pentamethyl-4'-
piperidinyl)] siloxane;

Reaction products of 2,2,4,4-tetramethyl-7-oxa-3,20-diaza-21-oxo-dispiro[5,1,11,12]heneicosane and epichlorohydrin; and

1,3-propanediamine N,N"-1,2-ethanediylbis-, polymer with 2,4,6-trichloro-1,3,5-triazine, reaction products with N-butyl-2,2,6,6-tetramethyl-4-piperidinamine.

13. The polymeric article of any preceding claim, wherein the polymeric material is a polyolefin homopolymer, copolymer, or terpolymer."

Independent [claim 19] was directed to "A light stabilisation additive composition". [Claims 20-22] were dependent on claim 19.

IV. Notice of opposition against the patent was filed by Ciba Specialty Chemicals Holding Inc., now BASF Specialty Chemicals Holding GmbH, on 29 July 2005 on the ground of Art. 100 (a) EPC (lack of novelty, lack of inventive step).

The opposition was supported *inter alia* by the documents:

D2: EP-A-0704560;

D3: DE-A-19229399;

D4: EP-A-0483488;

D5: "Balancing the colour and physical property retention of polyolefins through the use of high performance stabilizer systems", Presentation at the International Conference on Additives for Polyolefins, Houston, 23-25 February 1998;

- D6: Polymer Degradation and Stability 19, (1987),
p. 263-272;
- D7: JP-A-10017557 (Derwent abstract and partial
translation);
- D8: Journée d'Etudes sur La Stabilisation et le
Vieillissement des Matières Plastiques, in Paris,
17 October 1990, table 30;
- D9: Photooxidation and Stabilisation of Polyethylene,
10th Int. Conference on Advances in the
Stabilisation and Controlled Degradation of
Polymers, Lucerne, 25-27 May 1988;
- D10: Example A (originally filed by patent proprietor
with letter dated 23 June 2003 during the
examination phase);
- D11: Example B (originally filed by opponent with
letter dated 5 September 2003 during the
examination phase);
- D12: Test Report 1.

The opponent raised in particular the objections that the subject matter claimed was anticipated by documents D2 to D4 and lacked an inventive merit when starting from D2 as closest prior art.

V. In its answer to the notice of opposition dated 30 May 2006 the patent proprietor contested the objections of lack of novelty and lack of inventive step. The following documents were *inter alia* submitted with the reply:

- D13: Comparative test between triazines used in D2 and
by the patent proprietor;

D15: US-A-6020406; and

D16: Figs. A to C derived from the data of D12.

VI. In reply to the summons to oral proceedings before the opposition division the patent proprietor filed with a letter dated 8 March 2007 a new main request (claims 1-15). In addition to its previous argumentation the patent proprietor submitted that amended claim 1 resulted from the combination of [claim 13] and [claim 1] together with three compounds taken from the list recited in [claim 6], and, thus, fulfilled the requirements of Art. 123 (2) CBE.

VII. On that same day, 8 March 2007, the opponent filed the following new documents:

D2a: Priority document to D2;

D8: Figs. 6 and 13;

D18: CN-A-1056696 and its English translation;

D19: Brochure "Triazine 5" and its English translation;

D20: "Photodegradation, Photo-oxidation and Photostabilisation of Polymers", Wiley & Sons, 1975, p. 418-422.

In its accompanying letter the opponent argued that documents D2-D4, D2a and D18 anticipated the subject matter claimed. Furthermore, the inventive merit was denied starting from either D2 or D18 as closest prior art.

VIII. During the oral proceedings held on 9 May 2007 before the opposition division the opponent raised for the first time the objection that the subject matter of the

main request did not meet the requirements of Art. 123 (2) EPC.

IX. By a decision of the opposition division announced orally on 9 May 2007 and issued in writing on 25 June 2007 the patent could be maintained in its amended form according to the main request (claims 1 to 15 filed with letter of 8 March 2007). The single independent claim 1 was worded as follows:

"1. A polymeric article, comprising a polymeric material which is a polyolefin homopolymer, copolymer or terpolymer, from 50 to 5,000 ppm of at least one ortho-hydroxy tris-aryl triazine light absorber (triazine), and from 500 ppm to 1.25 percent of at least one oligomeric, polymeric, or high molecular weight HALS having a molecular weight of at least 500, wherein the weight ratio of HALS to triazine is from 3:1 to 20:1, and wherein the polymeric article is a molded article, an extruded article, or a biaxially oriented tape or film and wherein the HALS is an oligomer or a polymer or selected from the group consisting of:

Bis(1-octyloxy-2,2,6,6-tetramethyl-4-piperidinyl) sebacate;

1,3,5-triazine-2,4,6-triamine,N,N'' '[1,2-ethanediylbis[[[(4,6-bis[butyl(1,2,2,6,6-pentamethyl-4-piperidinyl)amino]-1,3,5-triazine-2-yl]imino)-3,1-propanediyl]]-bis[N',N''-dibutyl-N',N''-bis(1,2,2,6,6-pentamethyl-4-piperidinyl)]; and

1,3,5-triazine-2,4,6-triamine,N,N'' '[1,2-ethanediylbis[[[(4,6-bis[butyl(1-cyclohexyloxy-2,2,6,6-tetraamethyl-4-

piperidinyl)amino]-1,3,5-triazine-2-yl]imino)-3,1-propanediyl]]-bis-[N',N"-dibutyl-N',N"-bis(1,2,2,6,6-pentamethyl-4-piperidinyl)]."

Claims 2-15 were dependent claims directed to elaborations of the articles according to claim 1.

According to the decision, the requirements of Art. 123 (2) and (3) EPC were met because the amendments made were derivable from the combination of [claim 1], [claim 6] and [claim 13], taking into account that the three chemical compounds identified at the end of claim 1 corresponded to the only three high molecular weight HALS recited in [claim 6].

Regarding novelty, the opposition division considered that the documents cited by the opponent all failed to disclose the specific combination of technical features claimed ("mosaic disclosure").

Finally, considering that document D10 demonstrated that the claimed combination of HALS and UV absorber led to an improved light stabilisation, the opposition division acknowledged an inventive merit starting from D2 as closest prior art.

Under point 3 of its decision, the opposition division explained that D18 was not admitted into the proceedings on the basis of Art. 114(2) EPC because this document was considered as late filed and was not *prima facie* relevant for the assessment of novelty or of the inventive merit of the subject matter claimed. The opposition division concluded in particular that it could not be ascertained whether the compound

"Triazine-5" designated identical compounds in D18 and D19.

- X. A notice of appeal against the decision of the opposition division was filed on 31 July 2007 by the opponent with simultaneous payment of the prescribed fee. In its statement of grounds of appeal received on 18 October 2007, the appellant requested that the contested decision be set aside and that the patent be revoked because it did not meet the requirements of Art. 123 (2) EPC, Art. 54 EPC and Art. 56 EPC.

According to the appellant, the extraction of three specific high molecular weight HALS out of a list of four compounds recited in claim 6 would create a new genus which was not originally disclosed and, thus, would not be allowable under Art. 123 (2) EPC.

The appellant further objected that claim 1 of the amended patent would be anticipated by D2a and D3.

Regarding the inventive merit the appellant started from either D2/D2a or D18 as closest prior art. It argued that the patent proprietor had not rendered it plausible that an improved technical effect was present as compared to the closest prior art, so that the objective problem solved should be identified as the provision of a mere alternative. D10, in particular, did not allow a fair comparison to the closest prior art. The appellant concluded that it was obvious to solve this problem by using any alternative falling within the ambit of D2/D2a or D18, including those represented by the subject matter of valid claim 1. Reference was made to documents D2, D2a, D3, D6, D8,

D10-D13, D16, D18, D19, and D20. The following documents were *inter alia* additionally filed by the appellant in support of its argumentation:

D19a: Sworn statement of Mr. Lei Chenwei dated 26 September 2007;

D22: Absorption graph of Tinuvin 1577 (10 ppm in CHCl₃);

D23: Absorption graph of Cyasorb 1164L.

XI. In its reply dated 25 February 2008, the patent proprietor, now respondent, requested that the appeal be dismissed, that the contested decision be confirmed and that the patent be maintained in its amended form according to the decision of the opposition division or, alternatively, on the basis of either of the two auxiliary requests filed therewith. The argumentation was supported by the additional documents:

D25: Supplemental experimental report from the experiments of D13: HALS UV-3364 alone / with triazine / with benzophenone;

D26: Supplemental experimental report from the experiments of D13: Stabilizer compositions – Hours to 50% elongation for different triazines and HALS;

D27: Chemical Structures of triazines used in D26;

D28: New experiments: carbonyl index measurements at varying HALS/triazine ratios;

D29: New experiments: gloss index measurements – time to 50% gloss retention at varying HALS/triazine ratios.

The respondent contested that the present claims would include any new "genus" as compared to the application as filed and concluded that the requirements of Art. 123 (2) EPC were met.

The respondent further argued that the requirements of Art. 54 EPC were met since neither D2a nor D3 disclosed the specific combination of features claimed ("mosaic disclosures").

The inventive merit was considered to be supported by the data of D10, D13 and D25-29, which demonstrated that the claimed synergetic effect in terms of light stabilisation of the combination of HALS and UV absorber defined in claim 1. According to the respondent, this result would not be obvious. Reference was made to documents D2, D4, D6, D9, D15 as well as to experimental data filed during the examination phase (letter dated 17 May 2002).

Finally the respondent requested that document D18 should not be admitted into the proceedings because it was late filed and less relevant than the other documents cited in the proceedings, in particular D2.

XII. On 27 November 2009 the board issued a summons to attend oral proceedings and informed the parties of its provisional opinion.

It was questioned whether the subject matter of dependent claims 7-10 satisfied the requirements of Art. 123 (2) EPC.

The board further considered that novelty was given because none of the documents cited by the appellant disclosed the specific combinations of features according to claim 1 of the main request.

Finally the board indicated that the assessment of the inventive merit would be made following the problem-solution approach, probably starting from D2, in particular its example 13, as closest prior art and considering as problem to be solved the problem addressed in the patent.

XIII. In its submission dated 19 February 2010 the appellant raised the objections that none of the valid requests met the requirements of Art. 123 (2) EPC, Art. 54 EPC and Art. 56 EPC.

According to the appellant, by amending the claims so as to render them dependent on multiple preceding claims in each of the valid set of requests, the respondent had created new combinations of features which were not originally disclosed in the application as filed, wherein all claims were only depending on a single preceding claim. The requirements of Art. 123 (2) EPC were, thus, not met.

The appellant argued again that the subject matter claimed was anticipated by D2a.

The inventive merit was denied starting from either D18 or D2a as closest prior art. Reference was made for the first time in the appeal proceedings to documents D5 and D7.

Finally, the appellant further objected that the subject matter claimed would be a posteriori non unitary (Art. 82 EPC).

- XIV. With its letter filed electronically on 24 February 2010, the respondent requested that the patent in suit be maintained in its amended form according to either the main request (object of the contested decision) or any of the auxiliary requests 1-7 as filed on that day.

Concerning Art. 123 (2) EPC, the respondent maintained that the subject matter of the main request did not extend beyond the content of the application as filed.

The arguments previously brought to demonstrate novelty over D2a (as well as D2), D3 and D18 were maintained.

Finally, starting from either D2/D2a or D3 as closest prior art the subject matter claimed was considered to be inventive because none of the cited documents contained a motivation to provide polyolefin articles having improved light stability by modifying the teaching of the prior art according to the claims of the main request. Reference was made to documents D4 to D8 D10, D25, D26, D28 and D29 to support the claimed improvement in light stability.

- XV. Oral proceedings were held before the board on 24 March 2010.

Initial requests

The respondent requested the confirmation of the contested decision and the maintenance of the patent in

its amended form according to the **main request** or alternatively according to any of the **auxiliary requests 1-7** (all requests as filed on **24 February 2010**).

The appellant confirmed its request to **revoke the patent in its entirety** because neither the main request nor any of the auxiliary requests 1-7 fulfilled the requirements of Art. 123 (2) EPC, Art. 54 EPC and/or Art. 56 EPC.

Concerning the main request

XVI. Regarding Art. 123 (2) EPC

The chairman of the board acknowledged that the appellant had raised objections according to Art. 123 (2) EPC and further informed the parties that the board did not maintain its objections in this regard. Indeed, the board had not been able to trace a filing of the ground according to Art. 100 (c) EPC. Under these circumstances it had been decided in G 9/91 (published in OJ EPO 1993, 408: point 19 of the reasons) that an objection according to Art. 123 (2) EPC could only be made with regard to amendments which have been made during the opposition or the appeal phase. The appellant would, thus, be in a position to raise objections according to Art. 123 (2) EPC if, and only if, he could demonstrate that the subject matter claimed indeed amounted to an amendment of the granted claims (and not of the claims as originally filed).

The preliminary view of the board was that this was not the case because the subject matter of claim 1 was

derivable from the combination of [claim 13] with part of [claim 6], which, according to T 381/02 of 26 August 2004 (not published in OJ EPO), would not represent an amendment in the sense of point 19 of G 9/91.

The appellant explained that the subject matter of claim 1 was derivable from the combination of [claim 13], [claim 6], and [claim 1] whereby two of the generic classes of HALS had been maintained as such (the oligomeric and the polymeric HALS) whereas the third generic class of HALS (the high molecular weight HALS) had been replaced by three specific compounds which had been arbitrarily selected from the list of individual compounds recited in [claim 6]. The splitting of that list would have created a new genus which was not disclosed in the granted patent and would represent an amendment of the subject matter claimed. Indeed, due to the lack of an accepted definition in the art or of any information provided by the application as filed for the terms "oligomeric", "polymeric" and "high molecular weight" HALS the skilled person would not be in a position to decide to which category the compounds of [claim 6] would belong. The HALS corresponding to the fourth or the fifth embodiment of [claim 6] could e.g. be seen as a dimer i.e. an oligomer whereas the ninth compound ("reaction product of ...") could be a monomer, an oligomer, or a polymer depending on the reaction conditions used.

The respondent considered that claim 1 did not represent an amendment since it represented the mere combination of [claim 1] with [claim 6], depending on [claims 1-3], and with [claim 13], depending on [any preceding claims]. Besides, the skilled person would

immediately identify that the three compounds which were listed in claim 1 of the main request were high molecular weight HALS and not polymeric or oligomeric HALS from the information provided in paragraph [0011] (corresponding to page 5, line 18): all the HALS "useful in the invention" which are not listed as "polymer" or comprising the term "poly(...)" would inevitably be high molecular weight HALS. Such compounds corresponded to compounds (1), (4) and (5) of paragraph [0011] (or to the first, the fourth and the fifth compound given on page 5; the sixth compound being excluded since its chemical name was wrong and made no sense). Considering that all the "high molecular weight HALS" recited in [claim 6] had been incorporated into claim 1, the same information regarding the high molecular weight HALS would be provided in claim 1 as in [claim 6]. The respondent further argued that the selection of the three HALS was not arbitrary and would be allowable when considering [claim 6] as a list of dependent claims directed to each of the compounds listed therein: the combination of three of such claims with [claim 13] would not be an amendment. The respondent was further of the opinion that the argument of the appellant regarding the problem of partitioning of the list of [claim 6] related to the use of vague terms for distinguishing between the HALS was a problem related to clarity, which was not a ground of opposition.

XVII. Novelty over documents D2a and D3

The appellant maintained its written objections of lack of novelty with regard to documents D2a and D3.

The respondent repeated its objections brought in writing. Concerning the specific amounts and ratio of HALS and triazine light absorber, the respondent additionally explained that the fact that the ranges disclosed e.g. in D2a overlapped with those claimed was not sufficient to deny novelty. Reference was made to decisions T 65/96 of 18 March 1998 (not published in OJ EPO) and T 375/91 of 17 November 1994 (not published in OJ EPO).

XVIII. Documents D18, D19, and D19a

The parties contested whether or not these documents should be admitted into the proceedings. Noting that it was agreed upon that D18 was late filed the chairman of the board identified two distinct issues in relation to this question. The first one was whether or not the disclosure of D18 was relevant with regard to the subject matter claimed, namely the combination of polyolefin, HALS and triazine light absorber as defined in claim 1. The second was whether or not D18 together with D19 and optionally D19a disclosed a triazine light stabiliser as claimed i.e. whether the compound "Triazine-5" according to D18 was a triazine light stabiliser as defined in claim 1.

Subject matter disclosed in D18

The appellant agreed that the mandatory HALS used in D18 were phosphorous containing compounds which did not correspond to the HALS presently claimed. D18, however, had been found to anticipate some subject matter claimed in the granted patent: this was an evidence

that D18 was *prima facie* relevant for the patent in suit.

According to the appellant, D18 disclosed e.g. on page 2 and in the examples, all the technical features of claim 1 with the exception of the claimed HALS as a mandatory component. The specific amounts and the ratio of HALS and triazine light absorber would be obtainable from the ranges disclosed on page 2, lines 10 to 21, in particular when the combination of the endpoints were considered, what was allowable according to T 375/91. Also examples 1, 2, and 5 disclosed the claimed combination of features with the exception that a different class of HALS was used. Finally, the appellant submitted that the technical problem addressed in D18 was the same as in the patent in suit. Hence, D18 was *prima facie* relevant.

The respondent contested that D18 disclosed the specific combination of HALS and triazine as claimed. The only mandatory stabiliser taught in D18 was a phosphite ester (page 2, line 12), which was not a HALS as claimed, whereas polymeric HALS (such as Chimassorb 944 or Tinuvin 622: page 2, line 14) or the compound "Triazine-5" (page 2, line 21) disclosed in D18 were only optional. In particular, none of the examples disclosed the combination of a HALS as claimed and "Triazine-5". Besides, the respondent argued that the ratio and amounts disclosed on page 2 of D18 would not render mandatory that both compounds, if used, would be present in the amounts and ratio according to the main request. D18 was, thus, not *prima facie* relevant.

Identification of "Triazine-5" - Documents D18/D19/D19a

According to the appellant D19 showed that the compound "Triazine-5" according to D18 was an ortho-hydroxy tris-aryl triazine light absorber as claimed which had been developed and made available in 1975 by the Shangxi Provincial Institute of Chemical Industry. The only information missing in D19 for it to be a valid prior art was a publication date. This missing information would, however, have been provided in the form of the sworn declaration D19a, wherein Mr. Lei Chenwei certified that D19 was a brochure made available in 1975. The appellant noted that it could not be expected from a brochure intended to be used on the Chinese market in 1975 to exhibit the same standards of quality as those of large chemical companies nowadays. Finally, the credibility of a document could not be put into doubt on the mere ground that it was a Chinese document.

Regarding the objections raised in writing in relation to the fact that Mr. Lei, having graduated in 1982, could not have known what had happened in a company in 1975, the appellant considered that Mr. Lei could well have gained knowledge of a fact known to its company in 1975.

The appellant further referred to the Abstract on the front page of D18 which would make it clear that the auxiliary stabilisers used in D18 are "triazine", a term which would be equivalent to the "ortho-hydroxy tris-aryl triazine light absorber" of claim 1 because there was no other triazine light absorber.

The respondent contested that D19a could fill the gap created by the missing publication date of D19. Indeed,

it was doubtful that D19 would be a "brochure" since the document failed to exhibit any date, printed mark, trademark and/or contact person, which were information always present in brochures intended to be distributed e.g. to customers. This document could even be an internal document which had not been made available to the public. Hence, the origin of D19 was unknown and it had no probative value.

Concerning the sworn declaration D19a, the respondent noted that it was not derivable therefrom whence Mr. Lei had got his knowledge. Hence, the information contained in D19a represented mere unspecified hearsay. The respondent further brought the attention of the board to the fact that the "Shanxi Jiaocheng Chemical factory" mentioned in D19a did not correspond to the "Shangxi Provincial Institute of Chemical Industry" cited in D19.

The argument that the term "triazine" was equivalent to "ortho-hydroxy tris-aryl triazine light absorber" was contested.

On the basis of these missing pieces of information and inconsistencies, D19 and D19a were, thus, not sufficient evidence that the compound "Triazine-5" of D18 was identical to the compound illustrated on the first page of D19.

XIX. After deliberation the chairman announced that D18 was not admitted into the proceedings.

XX. The appellant withdrew its objection related to lack of unity of the subject matter claimed.

XXI. Assessment of the inventive merit

Closest prior art - Problem to be solved - Solution

Following the problem-solution approach both parties agreed to consider D2 as closest prior art. The respondent pointed out that D2 in its whole should be considered as closest prior art and not a single example such as example 13. Indeed, since the problem addressed in the patent encompassed improved stabilisation in general terms and more particularly in terms of mechanical properties ([example 1]) and/or gloss/yellowing ([example 2]), there was no reason to select example 13 (which showed improved mechanical properties) rather than examples 3 or 7 (which showed improved resistance to yellowing) as closest prior art.

The problem to be solved was considered by the parties to reside in the provision of a polyolefin article containing triazine light absorber and HALS and having an improved light stability as compared to D2.

The parties further agreed that the subject matter claimed differed from D2, e.g. examples 3 or 13, in using a different class of HALS and a higher HALS:triazine light absorber ratio. It was confirmed that this corresponded to the solution of said problem(s) as identified by the respondent.

Fair comparison to the closest prior art?

The appellant considered that none of the experimental data of D10 to D13, D25, D26, D28, D29 would represent a "fair" comparison to the closest prior art D2 since

they concerned completely different types of articles, different polymers, HALS, light absorbers, and/or additive packages. The appellant furthermore contested the argument brought in writing by the respondent that they would not have been in a position to reproduce the examples of D2 because the compound "HALS 1" used therein would not have been commercially available: it corresponded to Chimassorb® 905 which was distributed on the market.

The chairman of the board pointed the attention of the appellant to paragraph 3.4 of the preliminary opinion of the board wherein the parties had been informed that an exact comparison with the closest prior art would not always be mandatory in order to demonstrate the inventive merit of an invention, reference being made to T 35/85 of 16 December 1986 (not published in OJ EPO) and T 197/86 (published in OJ EPO 1989, 371) concerning the provision of variants lying closer to the claimed subject matter than the closest state of the art.

The respondent agreed with the latter statement of the chairman of the board and declared that D10 to D13, D25, D26, D28, and D29 differed from the claimed subject matter only in a single feature, namely the HALS:triazine ratio, and thus, lay closer to the invention than any example of D2, such as examples 3 or 13, which differed from said subject matter in at least two features (class of HALS; ratio HALS:triazine). According to the respondent, these experiments representing variants lying closer to the invention than any disclosure of D2, had in fact more clearly

demonstrated the advantageous effect attributable to the distinguishing feature(s) of the invention.

Experimental data on file

The appellant considered that the claimed synergy in terms of light stabilisation and in relation to the claimed ranges of HALS and triazine light absorber was not supported by the facts.

The only data of the patent in suit illustrating the subject matter claimed (last line of the table of example 1) merely showed a synergy emerging from the combination of HALS and triazine as compared to HALS alone, which was already well established in the art. Besides, the articles investigated in D2 were pigmented fibres which always comprised a pigment as mandatory component. It was not possible to compare results related to light stabilisation in terms of colour/yellowness (ΔE reported in D2) of pigmented and unpigmented systems. Indeed, the results of D2 were related to the decoloration resistance of the pigment, not of the fibre, and could not be used to evaluate the stability of the fibre itself.

Also the experimental data of D10-D12 were not pertinent because the total amount of stabiliser used in the different examples was varied and was not illustrative of the amounts used in D2.

Document D10 would not demonstrate a synergy related to the HALS and triazine but only showed that these additives had a mere additive or even antagonist effect. Reference was made to a drawing similar to that of Fig. 11.2 on page 419 of D20 to visualise this argument. Besides, no conclusion could be drawn from

D10 since the results with no HALS and no triazine light absorbers were not given. The appellant further considered that the system used in D10 was very specific and did not illustrate concentrations typically used for HALS and light absorber.

The data of D16 would merely reflect the expected behaviour of a mixture of HALS and UV stabilisers which was well known in the art.

The data presented in D28 and D29 could also not illustrate a synergy since the data with no HALS and no triazine were not reported.

The appellant, thus, concluded that the effect shown was not surprising and corresponded either to general knowledge or to what the skilled person would have expected.

The respondent pointed out that the criticisms of the appellant regarding an alleged lack of technical effect were not supported by the facts, which, at this stage of the proceedings, was the onus of the opponent (reference was made to decisions T 197/86 and T 35/85). This could have been done either by providing the missing values of D10 or performing similar experiments on other, allegedly more appropriate articles.

The respondent noted that the results of D10 would even be better if the experiments had been performed at constant stabiliser loading, since the amount of triazine light stabiliser would have had to be increased.

It was also contested that the data presented corresponded to specific cases not illustrative of usual concentration ranges.

Turning to Figs. 1-2 of document D12 together with the corresponding raw data computed on page 32 of their

last submission dated 24 February 2010, the respondent explained how four data points corresponding to experiments performed at a total amount of stabilisers of 1100 ppm had been identified. These points had been reported to draw the red curve of Fig. 1 in colour as filed during the oral proceedings (see Annex to the minutes). The point on the ordinate axis corresponded to no HALS and had been extrapolated from the data of Fig. 2 and the other points had been obtained from the curves at 250, 500 and 1000 ppm HALS. In addition, the domain corresponding to HALS:triazine light stabiliser ratio of 3:1 to 20:1 as claimed was also reported as the yellow shaded area on this graph. This Figure, which was obtained from data provided by the appellant, demonstrated that the best stabilisation was indeed obtained in the claimed ranges of HALS and triazine light stabiliser. The same conclusion would be drawn from document D16, which provided another interpretation of the same data.

The respondent also considered that D10, D13, D25, D26, D28, D29 or example 1 of the contested patent further showed an improved stabilisation in the claimed range of HALS and triazine light absorber and for different HALS or triazine as claimed.

Hence, the respondent concluded that the claimed effect had been positively proven and that the criticisms of the appellant were not supported by the facts.

Objective problem indeed solved

After deliberation the chairman declared that the objective technical problem identified by the board as arising from D2 was to provide a polyolefin article comprising an ortho-hydroxy tris-aryl triazine light

absorber and a HALS and having improved stability against UV for extended periods of time. According to the board, the evidence on file rendered it plausible that this problem had been effectively solved by the measures defined in claim 1 of the main request.

Obviousness of the solution

The parties addressed the issue of whether or not it would have been obvious to solve said problem by modifying the teaching of D2 according to the main request i.e. to modify both the class of HALS and the HALS:triazine ratio used e.g. in examples 3 or 13.

The appellant was of the opinion that the modification of the HALS:triazine ratio was obvious on the basis of the general knowledge about synergism of HALS and UV absorbers of the skilled person working in that field and considering that the same effect was known for similar systems as shown in D6. The appellant also considered that the effect shown by D10, D12, D13, D16, D25, D26, D28, and D29 merely reflected what a skilled person would have expected from a mixture of a HALS and a triazine light absorber. This could be derived e.g. from Figs. 2, 4, 6 of D6, which showed in particular an optimum stabilisation at a HALS:triazine light stabiliser of around 3:1. Also D20 reported the same kind of behaviour.

Regarding the nature of the HALS, D2 was not limited to HALS 1 as used in examples 3 and 13 but encompassed other HALS, including those as presently claimed. Hence, the skilled person would have been motivated to use another HALS in these examples, such as those

having a high molecular weight according to the main request.

The respondent considered that the skilled person would have had no motivation, either from D2 or from any other document cited, to increase the amount of HALS used in the best examples of D2 by a factor of at least two.

According to the appellant the Figures of D6 showed that the stabilisation decreased at HALS:triazine ratio higher than 3:1. Hence, D6 even taught away from the solution of the present invention.

Finally, should the general knowledge of the skilled person have been to use a ratio of HALS:triazine of 3:1 or higher, it was not understandable why D2 would not have considered using this ratio.

Furthermore, the teaching of D6 was that the synergetic effect observed was related to the diffusion of the HALS, a property which was generally known to be related to the size or the molecular weight of the HALS. On the basis of this knowledge the skilled person would have had no motivation to improve the stabilisation of the systems reported in D2 by using a high molecular weight HALS as claimed instead of the low molecular weight HALS.

The respondent concluded that the argumentation of the appellant was based on hindsight.

Final requests

- XXII. The respondent requested that the contested decision be confirmed and that a patent be maintained in its amended form on the basis of the **main request** or any of

auxiliary requests 1-7, all requests as filed electronically on 24 February 2010.

The appellant requested the **revocation of the patent** because neither the main request nor any of the auxiliary requests 1-7 fulfilled the requirements of Art. 123 (2) EPC, Art. 54 EPC and/or Art. 56 EPC.

XXIII. The board announced its decision at the end of the oral proceedings.

Reasons for the Decision

1. The appeal is admissible.

Main request

2. Objections related to Art. 123 (2) EPC

2.1 As conceded by the appellant during the oral proceedings before the board the ground of opposition according to Art. 100 (c) EPC was never filed during the proceedings. There is also no trace in the contested decision that this ground had been introduced by the opposition division on its own motion according to Art. 114(1) EPC. In addition, the patent proprietor/respondent has not requested during the appeal proceedings that this new ground should be introduced. Hence, following the conclusions of the Enlarged Board of Appeal the present board should not deal in substance with this ground since it does not form part of the current appeal proceedings (see G 9/91: point 18 of the reasons).

However, it remains that claim 1 was amended in comparison to [claim 1]. The question must, thus, be answered whether or not the main request comprises subject matter corresponding to an amendment of the claims in the course of opposition or appeal proceedings which would justify that its compatibility with the requirements of the EPC, including with regard to the provisions of Art. 123 (2) EPC, be examined by the board (see G 9/91: point 19 of the reasons).

Claim 1 corresponds to the combination of [claim 13], with [claim 1] and part of [claim 6]. Considering that [claim 13] was depending on "any preceding claim" and that [claim 6] was depending on "any one of claims 1 to 3", the mere combination of these three claims does not amount to a **substantive amendment** of the subject matter claimed in the granted patent and does not correspond, therefore, to an "amendment" in the sense of point 19 of the reasons of G 9/91. This conclusion is in agreement with constant case law of the boards of appeal see e.g. T 381/02, point 2.3 and in particular point 2.3.7 and 2.3.8 of the reasons, as well as the other decisions cited therein. Although this passage of T 381/02 addressed the question of whether the clarity of amendments made to granted claims may be examined for the first time at the appeal stage, the same reasoning applies and the same conclusion would be reached regarding whether a board may examine for the first time during the appeal proceedings if amendments of granted claims fulfil the requirements of Art. 123 (2) EPC.

Considering that in the present case [claim 13] has, however, not been combined with [claim 6] as a whole but only with a part of it (three specific compounds have been extracted out of the list of ten products), it remains to be examined whether or not this modification could amount to an amendment in the sense of point 19 of G 9/91, i.e. if it may represent a substantive amendment of the granted claims.

[Claim 6] was written as a list of ten individualised compounds and is, therefore, formally equivalent to a series of ten separate dependent claims, each directed to one these ten embodiments. Hence, the combination of [claim 13] with any of these ten compounds corresponds to a mere rewording of the granted claims, taking account of their dependency, which does not modify the substance of the subject matter claimed. There is in particular no new teaching or new information provided to the skilled person and created through this amendment. Contrary to the objection of the appellant the board does not consider that this amendment has led to the creation of a new "genus" as compared to [claim 6] or represents an "arbitrary selection" within its ambit. The amendment merely amounts to the combination of [claim 13], dependent on [claim 6], itself dependent on [claim 1], with three compounds listed as independent alternatives in [claim 6]. The board does not consider this splitting of [claim 6] as representing a substantive amendment.

In reaching its conclusion the board in particular disagrees with the appellant that an unallowable amendment emerges from the fact that in [claim 1] the terms oligomeric HALS and polymeric HALS have been

maintained as such, whereas the term high molecular weight HALS has been replaced by three compounds of [claim 6]. Indeed, the amendment merely amounts to the restriction of the subject matter covered by one of the three independent embodiments of [claim 1].

The appellant has objected in this regard that the original classification of [claim 1], which distinguished between polymeric, oligomeric and high molecular weight HALS, was not clear because of the lack of an accepted definition for these terms. Even if this might be true, it does not affect the conclusion of the board since the partitioning of [claim 6] which was done is not related to whether or not a specific category of HALS may be attributed to the ten specific compounds. The amendment made, indeed, does not change the subject matter claimed which is related to oligomeric or polymeric HALS and only restricts that part which is directed to the high molecular weight HALS to three compounds already recited as individual embodiments in [claim 6] and which, in the board's view indisputably correspond to high molecular weight HALS in the sense of the patent in suit. The argument of the appellant in this regard, that it would not be clear that the three selected compounds are high molecular weight HALS, did not convince the board. From their chemical structure, these compounds may at most be considered as dimers, i.e. the smallest possible form of oligomers. There is, however, no evidence on file demonstrating that the skilled person would consider such dimers as oligomeric HALS, as argued by the appellant. The board is further of the opinion that the skilled reader, to which the patent is addressed, would consider from the information provided in the patent that such compounds fall under the category of high

molecular weight HALS. This, incidentally, also corresponds to the findings of the opposition division (see last paragraph of point 2 on page 4 of the contested decision). The appellant has further criticised in this respect that the compound recited at lines 57-58 of [claim 6] ("Reaction products of (...)") may either be a monomeric, oligomeric, or polymeric HALS depending on the reaction conditions used. Even if this might be true, this does not imply that the amendment made by the respondent corresponds to an "arbitrary selection": it only restricts the high molecular weight HALS of [claim 1] to three of the compounds corresponding to this definition in [claim 6]. Whether a further compound may also be a high molecular weight HALS is irrelevant.

The board further notes that the three categories of HALS (oligomeric, polymeric, high molecular weight) were already recited in [claim 1] so that their clarity may not be objected to at this stage of the proceedings for the same reasons as above (G 9/91) and because lack of clarity is not a ground for opposition according to Art. 100 EPC.

To conclude, the replacement of the term high molecular weight HALS of [claim 1] by three compounds of [claim 6] corresponding to such HALS is not an "amendment of the claims (...) of a patent in the course of opposition or appeal proceedings" in the sense of point 19 of G 9/91 which would have had to be fully examined as to its compatibility with the requirements of the EPC, in particular with Art. 123 (2) EPC in the present case.

Finally, the board reached the same conclusion regarding the [dependent claims 2-15].

Therefore, the objections of the appellant with respect to Art. 123 (2) EPC are rejected.

- 2.2 It came to light during the present proceedings that the chemical names of some products listed in [claim 6] are not identical to the names of the corresponding compounds listed on page 5, line 20 to page 6, line 9 (compare [compounds (3), (6) and (9)] in [0011] with compounds 3, 7 and 10 on pages 5-6). This point is, however, not an issue at stake at this stage of the proceedings as explained above, because the ground of Art. 100 (c) EPC was not raised and because the patent proprietor/respondent has not requested the introduction of this new ground.

3. Novelty

The appellant objected that the main request would be anticipated by documents D2a and D3.

- 3.1 Document D2a is the US priority document of the European patent application D2. A file inspection of D2 reveals that D2a belongs to the prior art according to Art. 54 (2) EPC since it was made available to the public at the date of entry of D2 into the examination phase before the EPO, namely on 21 September 1995, which is before the priority date of the patent in suit. This point was not contested during the proceedings.

D2a deals with pigmented polymeric fibres comprising a synergetic combination of a UV absorber and a hindered

amine (claim 1). The polymer is preferably a polyolefin, a polyamide or a polyester (claim 2, depending on claim 1). Claim 5 is directed to a fibre according to claims 1-4 wherein the polymer is polypropylene i.e. a polyolefin. Claim 7 discloses a fibre according to claim 2 wherein the UV absorber is a benzotriazole or an s-triazine. Claims 9-11, which are dependent on claim 1, deal with specific amounts of hindered amine and UV absorber. Claims 12-13 are both dependent on claim 1 and recite a list of preferred UV absorbers, including triazines according to the main request, and HALS, respectively. Finally, both lists of preferred UV absorbers and HALS are further combined in claim 14, dependent on claim 1. Hence, claims 7 and 9-14 of D2a were not drafted as depending on any of the preceding claims but only on claim 2 and 1, respectively. Hence, the specific combination of polyolefin, HALS and ortho-hydroxy tris-aryl triazine according to claim 1 of the main request is not specifically disclosed in the claims of D2a and is not disclosed therein when the claims are read with their respective dependency. The argument of the appellant that the combination of claims 1, 5, 7, 9 and 13 of D2a disclosed the combination of polyolefin, HALS and triazine light absorber as claimed is, thus, rejected.

It is conspicuous to the board that the subject matter of each of the above claims is supported in full by pages 5 to 10 of the description of D2a. However, although this document discloses the three components of claim 1 individually, it fails to provide a disclosure for the specific combination of these features (mosaic disclosure of polyolefin, triazine and HALS as defined in claim 1). According to accepted case

law of the boards of appeal, in the case of a multiple selection, novelty can only be denied if one is able to show that the combined selection emerges from that prior art (see e.g. T 1042/06 of 16 December 2009, not published in the OJ EPO, point 3.2.1 of the reasons). The board could not, however, find in the whole disclosure of D2a any element which would have led the skilled person to concentrate on that precise combination of features.

The same conclusion was reached by the board when considering the combination of the claims of D2a with any passages of its description. In order to arrive at the combination of features according to claim 1 of the main request, one would have to make at least two choices regarding either the polymer, the HALS and/or the UV absorber within the alternatives taught in D2a. Starting e.g. from any of claims 7, 12, 13, or 14, one would have to select a polyolefin as polymer and a triazine as UV absorber.

Considering that the specific combination of polyolefin, HALS and triazine light absorber is not anticipated by D2a, there is no need to assess whether or not D2a discloses the specific amounts and the HALS:triazine ratio presently claimed in its claims and/or its description.

Finally, none of the examples of D2a discloses the claimed combination of features. Examples 3, 7, 13, 16, and 27 are the most pertinent examples in this regard: they disclose polyolefin fibres comprising a triazine light absorber as claimed but were all performed using a HALS which is not according to the present claims and

using a HALS:triazine light absorber ratio of at most 1.5:1, i.e. smaller than the ratio presently claimed. These examples would have to be modified at least twice in order to arrive at the subject matter of claim 1 of the main request. Although it is generally accepted that the teaching of a prior art document is not confined to the information provided in the examples and embraces the disclosure of that document as a whole, when it comes to decide what can be directly and unambiguously derived from a document its different passages may only be combined if the skilled person would see a good reason for combining them (see e.g. T 235/04 of 29 June 2006, not published in OJ EPO: point 3.2 of the reasons; T 941/98 of 30 March 1999, not published in OJ EPO: point 5.1 of the reasons). In the absence of any element in that sense in D2a, also these examples do not anticipate the subject matter of the main request.

Therefore, the board concludes that the specific combination of features of the main request is neither explicitly disclosed nor implicitly hinted at and is, thus, novel over D2a.

- 3.2 For the sake of completeness, the board notes that the same conclusion was arrived at regarding document D2 (claiming D2a as priority), which exhibits a similar set of claims and equivalent passages of the description and a similar set of examples as D2a.
- 3.3 Document D3 deals with a mixture of additives for the stabilisation against light of polyolefin compositions, said mixture comprising (A) a HALS and either (C1) a UV absorber or (C2) a pigment or (C3) a mixture of (C1)

and (C2) (D3: claims 1, 9-10 and 14-16; page 2, lines 1-6; page 9, lines 50 to page 10, line 27; page 10, lines 57-58; page 13, lines 30-31). The UV absorbers are, thus, not mandatory components of the compositions of D3 and may be totally replaced by a pigment (C2). These UV absorbers are, in addition, not limited to the sole triazines as claimed in the main request but encompass a whole list of alternative stabilisers (see e.g. claims 9-10 of D3). The amounts of HALS and UV absorbers and their relative ratios which are disclosed on page 10, lines 28-43 of D3 are found to overlap with the specific amounts and ratio according to claim 1 of the main request, i.e. this feature of the claims of the main request is also not mandatorily met by an embodiment illustrative of the teaching of D3. Finally, the compositions of D3 may be used for making various products encompassing articles as presently claimed, although this passage is not restricted to such articles (see page 10, lines 53-55). D3, therefore, fails to disclose the specific combination of a HALS with an ortho-hydroxy tris-aryl triazine in the specific amounts and HALS:triazine light absorber as presently claimed. Besides, although all the elements of claim 1 of the main request may be found at different, isolated passages of the description, one has to make several choices within the ambit of D3 in order to arrive at the claimed subject matter i.e. one would have to decide to make an article as claimed, to use for the additive mixture a UV absorber as at least part of compound (C), to select a triazine as claimed among the alternative UV absorbers taught in D3, and finally to use the correct specific amounts as well as the correct ratio of HALS and

triazine corresponding to those of claim 1 of the main request.

The examples of D3, although they all deal with polyolefin articles comprising a HALS as claimed, were not performed using an ortho-hydroxy tris-aryl triazine according to claim 1 of the main request and none of them uses a HALS:UV absorber ratio of 3:1 to 20:1. These examples would, thus, have to be modified in at least two features in order to arrive at a subject matter according to claim 1 of the main request. Following this analysis, the argument of the appellant that D3 would disclose the combination of polyolefin, HALS and triazine UV absorber as claimed is rejected.

The board concludes that novelty over D3 is to be acknowledged since D3 fails to disclose directly and unambiguously the combination of features recited in the claims of the main request.

3.4 The board is satisfied that none of the other documents cited in the proceedings anticipate the subject matter claimed (concerning document D18, see point 4 hereinafter).

3.5 Therefore, the main request satisfies the requirements of Art. 54 EPC.

4. Late filed documents: D18, D19 and D19a

As explained in point 3 of the contested decision the opposition division made use of its discretionary power under Art. 114 (2) EPC and decided not to admit D18 into the proceedings during the opposition phase. Since D18 was cited in the statements of grounds of appeal

and was considered by the appellant as representing a suitable closest prior art for the assessment of the inventive merit, it has to be decided whether or not this document should be admitted into the current proceedings.

It was not disputed by the parties that document D18 is to be considered as late filed since it was filed well after the nine month deadline of Art. 99 (1) EPC and was not mentioned in the notice of opposition. According to the EPO case law, in proceedings before the boards of appeal, new facts, evidence and related arguments, which go beyond the "indication of facts, evidence and arguments" presented in the notice of opposition pursuant to Rule 76 (c) EPC (former Rule 55(c) EPC 1973) in support of the grounds of opposition on which the opposition is based, should only very exceptionally be admitted into the proceedings in the appropriate exercise of the board's discretion, if such new material is *prima facie* highly relevant in the sense that it can reasonably be expected to change the eventual result and is thus highly likely to prejudice maintenance of the European patent" (see e.g. point 2 of the headnote of T 1002/92, published in OJ EPO 1995, 605). It has, thus, to be examined if D18 is "*prima facie* highly relevant".

Combination of additives disclosed in D18

D18 discloses the stabilisation of polyolefin materials e.g. blow moulded films using a combination of additives. These additives comprise a phosphite ester as mandatory component which may be combined with other, optional components including polymeric HALS

such as Chimassorb 944 and Tinuvin 622 and/or a compound called Triazine-5 (claim 1; page 7, lines 9-23). It is noted that the use of a polymeric HALS requires one selection among the list of three stabilisers listed on page 2, line 14 since the third component, Tinuvin 144, is neither a polymeric/oligomeric HALS nor corresponds to one of the three high molecular weight compounds claimed. The same is valid regarding the corresponding passage of the description on page 2, lines 17-18, wherein the same choice is required within a list of two components. Finally, the fact whether or not the compound "Triazine-5" is an ortho-hydroxy tris-aryl triazine light absorber as claimed is discussed separately hereinafter (see paragraph Identification of the compound "Triazine-5").

Hence, the combination of a polymeric HALS and of "Triazine-5" may only be disclosed from claim 1 of D18 after performing two choices among two different lists of optional stabilisers. The same holds true for the disclosure on page 7, lines 9-23 of D18. Consequently, none of the examples of D18 discloses a combination of additives which anticipates the subject matter of claim 1.

Amounts of additives taught in D18

It is possible to calculate the respective allowable amounts of HALS and "Triazine-5", if present, and their weight ratio as given in the main request from the information of claim 1 of D18 as follows (the data derived as such from D18 are given in "regular" font; the calculated values are given *in italic*; MB stands for masterbatch):

minimum amount of HALS in MB: 4 w.%
maximum amount of HALS in MB: 11 w.%
ratio of phosphite ester:HALS in MB = 3:2
(i.e. the HALS makes up 40 w.% of the HALS/phosphite
ester mixture in the MB)
w.% HALS in MB = $[0.4 \times 4; 0.4 \times 11] = [1.6; 4.4]$
w.% Triazine-5 in MB = $[1.3; 2.6]$

minimum amount of MB in film: 5 w.%
maximum amount of MB in film: 15 w.%
w.% HALS in film = $[0.05 \times 1.6; 0.15 \times 4.4] =$
 $[0.08; 0.66]$

ppm HALS in film = [800;6600]

w.% Triazine-5 in film = $[0.05 \times 1.3; 0.15 \times 2.6] =$
 $[0.065; 0.39]$

ppm Triazine-5 in film = [650;3900]

weight ratio HALS:Triazine-5 in film =
 $[800/3900; 6600/650] = [0.2; 10.2] = [1:5; 10.2:1]$

According to claim 1 of the main request these
respective amounts are:

ppm HALS in article = [500;12500]

ppm triazine in article = [50;5000]

w. ratio HALS:triazine in article = [3:1;20:1]

From this analysis, it turns out that although the
absolute amounts of HALS and UV-absorbers taught in D18
are within the ranges of the main request, the range of
HALS:triazine weight ratio according to D18 overlaps
with the corresponding range claimed: hence, in order
to arrive at the subject matter claimed one would have
to choose to use a specific HALS:triazine ratio within
the ambit taught in D18. There is, however, no hint in
D18 which would motivate the skilled person to perform

this particular choice, in particular to associate a specific weight ratio of at least 3:1 to a combination of a polymeric HALS as claimed in the main request and of "Triazine-5". Example 5 in particular, which is the only example performed using a phosphite ester and the combination of the HALS Tinuvin 144 and "Triazine-5", uses a HALS:triazine ratio of 1.33:1, i.e. smaller than the ratio claimed. In addition, Tinuvin 144 is not a polymeric or an oligomeric HALS and is not a high molecular weight HALS as presently claimed.

The appellant argued that the endpoint ranges would be specifically disclosed. Even if this assumption was to be true, D18 still does not teach to combine this specific end point (e.g. the above identified weight ratio of maximum 10.2:1) to any specific combination of additives, in particular not to mixtures comprising a HALS according to the main request and "Triazine-5".

Identification of the compound "Triazine-5"

It was further disputed by the parties whether or not it could be ascertained that the compound "Triazine-5" is an ortho-hydroxy tris-aryl triazine light absorber as claimed. Since D18 provides no information in this regard the appellant relied on documents D19 and D19a in order to clarify this issue.

D19 discloses on page 1 that "Triazine-5" is a compound having a chemical structure corresponding to that of an ortho-hydroxy tris-aryl triazine according to the light absorber (triazine) of the main request. The origin of D19 is, however, unclear and the document bears no publication date. D19 contains in particular no

indication which would render plausible that this document has ever been made available to the public, or even that it had been intended to be distributed e.g. to customers. Hence, this document could represent internal documentation which does not make part of the prior art according to Art. 54 EPC.

Document D19a was filed by the appellant in order to further clarify this point but did not convince the board either. Although it is presented as a sworn declaration made by Mr. Lei Chenwei, a Chinese citizen, there is no evidence of the legal authority in front of which this sworn statement would have been made. This document is, thus, equivalent to an unsworn statutory declaration but may not be considered as a sworn statement according to Art. 117(1)(g) EPC, and this, even if such a reference is made on the front page of D19a (second line of its title).

In this document Mr. Lei declared that he is a plant manager of the Chinese company Shanxi Jiaocheng Chemical factory and that "Triazine-5" was available from 1975 onwards and corresponded to a compound according to the brochure D19, which had been made available to the public that same year. It is conspicuous to the board that the name of the company for which Mr. Lei certified he has been working for is not identical to that of the Institute which is said in D19 to have developed "Triazine-5". The appellant, however, did not explain why the identities of these entities were different or given any information with regard to their possible relationship. In addition, D19a does not indicate how Mr. Lei has gained knowledge of the content of D19: it could have been obtained

through unspecified hearsay from another person, so that the demonstrative effect of D19/D19a is weak. Under these circumstances, the board considers that D19 and D19a provide no sufficient evidence that the compound "Triazine-5" referred to in D18 is the compound illustrated on page 1 of D19 and is, thus, a triazine light absorber as claimed in the main request.

Conclusion

The board concludes that D18 alone does not disclose directly and unambiguously the combination of at least two stabilisers in the claimed ratio according to the main request. Besides, there is no convincing evidence on file, even upon consideration of D19-D19a, that the compound "Triazine-5" according to D18 corresponds to an ortho-hydroxy tris-aryl triazine light absorber according to claim 1 of the main request. Hence, D18 is late filed, not *prima facie* highly relevant, and not more pertinent than other allowable prior art documents such as D2, D2a or D3. D18 is, thus, not admitted into the proceedings (Art. 114(2) EPC).

5. Inventive step

The inventive merit will be assessed according to the problem-solution approach.

5.1 Closest prior art

The problem to be solved by the contested patent is to provide a synergetic additive mixture for the stabilisation against light of polyolefins, said mixture comprising HALS and UV absorbers. In the patent

in suit, said stabilisation is defined as the prevention of the degradation from exposure to UV light (paragraph [0019]) and is assessed by measuring the retention of the elongation at break upon exposure ([example 1]) or the colour retention (gloss and yellowing: [example 2]). Hence, the problem to be solved which is derivable from the contested patent is seen as the retention upon light exposure of the mechanical and colour properties of articles comprising polyolefins. This problem is also derivable from the application as filed (*page 8, lines 24-34*). The board, thus, agrees with both parties that D2 represents the closest prior art since it deals with the same problems (see D2: page 3, lines 23-27; page 9, lines 57-58; examples 1-10, 19-30: colour retention; examples 11-18: retention of mechanical properties) and has the most technical features in common with the claims of the main request.

5.2 Defining the alleged problem solved in view of the closest prior art

The respondent/patent proprietor defined the problem to be solved as to provide a synergetic light stabilising mixture for polyolefins which shows an improved light stabilisation, in particular in terms of better maintenance of the mechanical properties and colour retention (gloss) as compared to other HALS:UV stabilisers mixtures i.e. including the examples of D2, in particular its examples 3 and 13.

5.3 The solution

According to the respondent/patent proprietor the solution of said problem resides in the selection of a triazine UV absorber as claimed together with either an oligomeric HALS, a polymeric HALS or one of the three HALS recited in claim 1 and in the use of a specific HALS:triazine ratio as indicated in claim 1.

5.4 Examination of the success of the solution

Analysis of the experimental data on file

The examples of the patent provide no data in this regard: only example 1 specifically deals with articles made from polyolefin compositions as presently claimed but only compares the performances of a specific HALS:UV absorbers combination as compared to HALS only.

D10 illustrates the teaching of D2 and shows the light stabilisation of polypropylene articles using various ratios of HALS (Chimassorb® 119) and a triazine light absorber (UV-1164) at HALS:triazine ratios varying between 1.5:1 to 20:1, the amount of HALS remaining constant at 0.75 w.%. Chimassorb® 119 is a high molecular weight HALS corresponding to the second of the three compounds recited in claim 1 of the main request (see formula of HALS 5 according to D8). UV-1164 is a UV-absorber according to claim 1 of the main request (see last paragraph of the first page of D10). The data of D10 show that the light stabilisation of polyolefins is improved when a HALS:triazine weight ratio between 3:1 to 20:1 is used as compared to a ratio of 1.5:1.

The argument of the appellant that i) these data would support a mere additive or even an antagonist effect and ii) that these could not support a synergetic effect since the end points at zero HALS and zero UV absorber were missing did not convince the board. It is, first, noted that the appellant has not provided any data of its own in order to support his criticisms. It is further agreed that the comparison should be done at a constant total amount of stabilisers. On the basis of the data of D10 and taking the example with a 1.5:1 ratio as reference, a fair comparison would, thus, imply that the amount of the HALS should have been increased and that the amount of UV absorber should have been decreased as a function of increasing HALS:UV-absorber ratios as compared to the experiments effectively reported in D10. Since it is accepted that the HALS has a higher stabilising effect than the UV-absorber, this makes it plausible that one would have achieved, under these circumstances of "fair comparison at constant total amount of stabilisers", an even improved stabilisation as compared to what is actually reported in D10.

D12 together with D16 shows the retention of mechanical properties upon light exposure of films made from polypropylene as polyolefin and comprising various amounts of HALS (Chimassorb® 944: a polymeric HALS as claimed) and triazine UV absorber (Tinuvin 1577: UV absorber as claimed), hence using the same UV stabiliser but using a different HALS than in example 13 of D2 of D2 (Chimassorb® 944 is used as HALS instead of HALS 1, which is Chimassorb® 905). D16 in particular is derived from the data of D12 and compares the performances obtained at two specific total amounts

of stabilisers of 1100 ppm and 1250 ppm. The first data plot at 0 ppm triazine is extrapolated from Fig. A of D12 on the basis of three other data points and under the assumption of a linear correlation (see point 61 of the letter of the respondent filed during the opposition phase and dated 30.05.06). Figs. B and C of D16 show that an improved stabilisation is obtained at a HALS:triazine ratio of 10:1 (Fig. B) or 4:1 (Fig. C) as compared to ratio outside the claimed range. These results are further illustrated in another form by the graphs of D12 filed by the respondent during the oral proceedings (see in particular Fig. 1 in colour as given in Annex to the minutes of the oral proceedings). These data, thus, also render plausible the existence of an improved stabilisation over the claimed range.

A similar synergy in terms of light stabilisation is further shown in:

D13, wherein the same HALS and two different triazine compounds as claimed are used at a similar total amount of stabilisers in HDPE articles;

D25-D26, which illustrate for various polyethylene articles that the use of a specific polymeric HALS (Cyasorb UV-3346) and various triazine UV absorbers as claimed in a HALS:triazine ratio of 7:1 provides an improved light stabilisation as compared to HALS only or as compared to same HALS and benzophenone UV absorber in a ratio of 7:1;

D28-D29, wherein the combination of a specific HALS (Cyasorb UV-3346: a polymeric HALS according to D27) and a specific triazine UV absorber (Cyasorb UV-1164:

see D27) in moulded polyethylene films leads to an optimum in the light stabilisation for HALS:triazine ratio of between [3:1;20:1].

(Un)fair comparison with D2?

It is true that none of the documents analysed above specifically deals with an article according to an example of D2. It is, however, considered that the evidence on file represents variants lying closer to the invention than any disclosure of D2, in particular example 3 or 13, so that the advantageous effect attributable to the distinguishing feature(s) of the invention is in fact more clearly demonstrated (T 35/85: point 4 of the reasoning; T 197/86: points 4, 6.1 and 6.1.2 of the reasoning). Example 13 of D2 for instance differs in two features from the subject matter claimed, namely the class of HALS and the HALS:triazine ratio). The examples of D10, D12, D16, D25, D26, D28 and D29, although they do not illustrate D2, are closer to the claimed subject matter and only differ therefrom in a single feature, namely the HALS:UV absorber ratio. These examples further show that at a given amount of HALS, varying the quantity of UV absorbers within the range claimed leads to a synergy in the UV stabilisation. Finally, the board considers that since the effect has been demonstrated under even more stringent conditions, the same effect is deemed to be also present in comparison to the closest prior art.

These facts, thus, support the presence of a technical effect at least over part of the scope of the claims.

Furthermore, there is no evidence on file which may refute the presumption created by the granted patent that the alleged problem is solved and that an effect is present over the whole scope of the claims (T 35/85: point 5 of the reasoning; T 197/86: point 6.1.1 of the reasoning). The appellant has in particular not provided any evidence showing that the claimed effect is not obtained at least over part of the scope of the claims.

The objection of the appellant that the amounts of additives used in the experiments of D10 are not illustrative of the common ranges used in the present technical field and represents a kind of "special case" is not substantiated and not supported by any evidence. Similarly, the criticism that the articles made in the experiments of the respondent do not illustrate fibres according to the closest prior art D2 is not convincing: it would have been the duty of the appellant to show that the claimed effect is not present under certain circumstances e.g. when other articles such as fibres are made.

Hence, the above analysis of the data on file led the board to conclude that the claimed synergy has been rendered plausible, the improved retention of the mechanical properties being shown by D10, D12, D16 and D28 and that of the colouration/gloss by D29.

5.5 Objective problem indeed solved

As a consequence of the conclusions drawn above the objective problem indeed solved arising from D2 is formulated as how to provide a polyolefin article comprising an ortho-hydroxy tris-aryl triazine light

absorber and a HALS, and having improved stability against UV for extended periods of time.

- 5.6 Examining whether the proposed solution is obvious with regard to the state of the art

Concerning D2

D2 does not provide any hint which would lead the skilled person to combine a HALS as claimed and a triazine UV-absorber, in particular not with the objective in mind to solve the above identified objective problem.

Examples 13 and 16 of D2 show that for the pair of additive HALS 1 (not according to the present claims) and UVA 3 (as claimed), using a HALS:triazine ratio of 1.5:1 (example 13) leads to improved performance in terms of mechanical properties compared with using a 1:1 ratio (example 16).

Examples 3 and 7 of D2 show that for the pair of additive HALS 1 (not according to the present claims) and UVA 3 (as claimed), using a HALS:triazine ratio of 1.5:1 (example 3) leads to worse performance than when using a 1:1 ratio (example 7).

Hence, the teaching of D2 is that:

- i) in order to improve the mechanical properties one should increase the amount of HALS as compared to the triazine; and
- ii) in order to improve the colouration properties one should increase the amount of triazine as compared to the HALS.

The skilled person aiming at improving both properties simultaneously would not find any guidance in D2 with

regard to the relative amounts of HALS and UV absorber to be used. In particular, D2 does not provide a motivation to use a weight ratio of HALS:triazine absorber of 3:1 to 20:1 in order to improve the light stabilisation of polyolefin articles.

Concerning the other cited documents

None of the other cited documents contains a hint to combine a HALS as claimed and a triazine UV-absorber, in particular not with the aim of solving the above identified objective problem.

Document D6, in particular, even teaches away from the proposed solution. Although it deals with a different systems of stabilisers (low molecular weight HALS in combination with benzotriazole UV absorbers), D6 teaches on page 271, last paragraph before the conclusion, that the synergy in terms of light stabilisation obtained is attributed to diffusion of the HALS from the polymer bulk towards the surface. Considering that it is accepted in the art that such diffusion phenomena are related to the molecular size and hence to the molecular weight of the diffusing components, it would not have been obvious for the skilled person to increase the light stabilisation by replacing, against the teaching of D6, the low molecular weight HALS taught therein by high molecular weight HALS as defined in claim 1 of the main request.

Conclusion

Starting from D2 as closest prior art, it was not obvious to provide an improved light stabilising mixture for polyolefin articles as compared to D2 by combining a HALS and a triazine absorber, used in the specific amounts and in a specific HALS:triazine weight ratio as recited in the claims of the main request.

5.7 The board is, thus, satisfied that the main request fulfils the requirements of Art. 56 CBE.

6. The main request is, thus, allowable.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:

E. Goergmaier

R. Young