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**Datasheet for the decision
of 4 September 2019**

Case Number: T 0603/14 - 3.5.02

Application Number: 05826507.5

Publication Number: 1969609

IPC: H01B7/02, H01B13/14, C08J9/10

Language of the proceedings: EN

Title of invention:
Electric Cable Comprising a Foamed Polyolefin Insulation and
Manufacturing Method Thereof

Patent Proprietor:
Prysmian S.p.A.

Opponent:
Nexans

Relevant legal provisions:
EPC Art. 100(a), 100(b), 54, 56, 83
RPBA Art. 13(1)

Keyword:

Sufficiency of disclosure (yes) - objection based on non-claimed technical effect and inconclusive comparative tests
Novelty (yes) - features disclosed individually but not in combination, alleged result to be achieved is structural feature which cannot be ignored in the assessment, comparative tests do not demonstrate that feature is disclosed in prior art documents

Inventive step (yes) - could/would, inconclusive comparative tests

Admissibility (no) - late-filed objection of lack of inventive step based on documents forming a basis of the appeal proceedings raised for the first time in oral proceedings without justification for its late submission

Decisions cited:

T 2001/12, T 0181/17

Catchword:

See point 7. of the reasons



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Case Number: T 0603/14 - 3.5.02

D E C I S I O N
of Technical Board of Appeal 3.5.02
of 4 September 2019

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Decision under appeal: **Interlocutory decision of the Opposition
Division of the European Patent Office posted on
16 January 2014 concerning maintenance of the
European Patent No. 1969609 in amended form.**

Composition of the Board:

Chairman R. Lord
Members: F. Giesen
R. Cramer

Summary of Facts and Submissions

I. This appeal by the opponent lies from the interlocutory decision of the Opposition Division of the European Patent Office posted on 16 January 2014 concerning maintenance of the European Patent No. 1 969 609 in amended form.

II. The following documents are relevant for the present decision:

D1 JP H 03269029 A with English translation

D2 JP S 581530 A with English translation

D3 JP H 0992055 A with English translation

D4 JP H 07122139 A with English translation

D5 WO 03/088274 A

D11 Summary of comparative tests by appellant

D12 Product Technical Information BPD3669, May 2012, INEOS

D13 Product Information BPD3042, August 2005, Innovene

D23 Summary of comparative tests by respondent.

III. Oral proceedings before the Board took place on 4 September 2019. The final requests of the parties were as follows:

The appellant (opponent) requested that the decision under appeal be set aside and that the European patent No. 1 969 609 be revoked.

The respondent (patent proprietor) requested that the appeal be dismissed, or alternatively that the decision under appeal be set aside and the patent be maintained

in amended form on the basis of the claims of one of the first to third auxiliary requests filed with the reply to the statement of grounds of appeal, or of the fourth auxiliary request filed with the letter of 2 August 2019.

IV. Claim 1 of the main request was not amended in opposition proceedings and reads as follows:

"Process for manufacturing an electric cable comprising at least one core comprising a conductor and an expanded and cross-linked insulating coating surrounding said conductor, said process comprising the steps of:

- providing a polyolefin material, a silane-based cross-linking system and a foaming system comprising at least one exothermic foaming agent in an amount of from 0.1% to 0.5% by weight with respect to the total weight of the polyolefin material;*
- forming a blend with the polyolefin material, the silane-based cross-linking system and the foaming system;*
- extruding the blend on the conductor to form the insulating coating."*

Claim 25 according to the main request reads as follows:

"Electric cable comprising at least one core consisting of a conductor and an insulating coating surrounding said conductor and in contact therewith, said insulating coating consisting essentially of a layer of expanded, silane-crosslinked polyolefin material having an expansion degree of from 3% to 40%,

characterized in that the insulating coating has an average cell diameter equal to or lower than 300 μm ."

In view of the outcome of this decision, the wording of the claims of the auxiliary requests does not need to be reproduced here.

V. The arguments of the appellant relevant for the present decision were essentially as follows:

(a) Insufficiency of disclosure

The opposed patent did not disclose the invention in a manner sufficiently clear and complete for it to be carried out. The comparative tests summarised in document D11 showed that a large number of cables manufactured according to the claim specifications did not pass the hot set test and did not show the desired tensile strength. While it was true that the cross-linking agent SILFIN 53 contained an antioxidant, this did not per se inhibit cross-linking. The temperature profiles in D12 and D13 were merely recommendations which did not have to be followed, especially as a foaming agent was used during extrusion. These comparative tests thus showed that none of the cables was sufficiently cross-linked as required by claim 1. It followed that the claimed method worked only with very specific starting materials, which the claim would have had to specify.

Additionally, the cited properties of cable 17* in Tables 1, 2 and 4 were contradictory so that a skilled person could not carry out the invention.

The embodiment described in paragraphs [0057] and [0066], which corresponded to claims 25 and 31 of the opposed patent, was contradictory. Paragraph [0057] required that the insulating layer "consisted essentially" of a foamed and expanded polyolefin, whereas paragraph [0066] stated that there could be a non-foamed layer adjacent to the conductor. The invention could thus not be carried out.

(b) Lack of novelty

The method of claim 1 according to the main request was not new in view of document D1. A skilled person did not have to make a choice from different lists. One list contained 17 exothermic foaming agents out of a total of 19 foaming agents and thus directly and unambiguously disclosed exothermic foaming agents. The use as a cable coating was directly disclosed on page 22, lines 10 to 18. Extrusion was the classic manufacturing technique in the technical field of cable coating and was disclosed on page 5, line 22 or page 4, line 6. The lists concerning suitable cross-linking agents contained only four groups, one of which was silane-based agents. There was therefore *de facto* only one short list to choose from.

The cable according to claim 25 according to the main request was not new in view of documents D1 and D3 to D5, because the feature concerning the average size of the cells was a result to be achieved and should be disregarded in the assessment of novelty. Additionally, the comparative tests of D11 showed that all cables manufactured had an average cell size in the claimed range. This showed that the feature was intrinsically disclosed in the prior art documents, too.

(c) Lack of inventive step

The method of claim 1 did not involve an inventive step in view of the comparative tests, which showed that the subjective technical problem was not solved. It furthermore did not involve an inventive step in view of D5 from which the process of claim 1 differed only in the amount of the foaming agent. The claimed amount of 0.1 wt-% was however suggested in D1 or D2 for a foamed electrical cable insulation. The method of claim 1 furthermore did not involve an inventive step starting from D1 in view of D3, which disclosed the specific combination of features, that might be regarded as not directly disclosed in D1 in combination. Regarding the cable according to claim 25, the average cell size represented merely a random choice to which no clear technical effect was attributable. Since D11 showed that the majority of foamed polyolefins would have the claimed cell size, the cable according to claim 25 did not involve an inventive step.

(d) Admissibility of new objection

The objection of lack of inventive step based on documents D1 and D3 should be admitted. It was filed in response to the Board's preliminary opinion regarding novelty in view of D1 communicated in the annex to the summons. The documents had already been known to the respondent. It could not come as surprise that D1, having been adduced against the novelty of claim 1, would also be used for assessing inventive step of the same claim. The combination of the two documents was *prima facie* highly relevant.

VI. The arguments of the respondent relevant for the present decision were essentially as follows.

(a) Sufficiency of disclosure

The comparative tests adduced by the appellant had no probative value. Firstly, they suffered from a biased selection of the cross-linking system, which contained electron scavengers thus inhibiting proper cross-linking. Counter-tests according to document D23 showed that cable 2 of document D11 could be properly cross-linked with a suitable cross-linking system. Secondly, the temperature profiles in the extruder corresponded neither to the manufacturers' recommendations nor to the teaching of the opposed patent. By taking into account Tables 1 to 4 of the opposed patent, it could easily be verified that Table 1 contained an obvious error. The correct values of density and expansion degree of cable 17* could easily be inferred. The wording "essentially consisting of" in paragraph [0057] and claim 25 allowed the presence of a further non-foamed layer.

(b) Novelty

D1 did not disclose directly and unambiguously the combination of features of claim 1. The appellant's approach amounted to cherry picking features from different lists concerning the use, the manufacturing step of extrusion, the foaming agent and the cross-linking system. D1 failed to disclose that the coatings were insulating. The cable of claim 25 was also new. The average cell size was a structural feature, not a result to be achieved, and could therefore not be ignored in the assessment of novelty. None of the cited

documents disclosed the claimed cell size. It could not be concluded from the comparative tests of D11 that the claimed cell size was an intrinsic feature of the cables according to D1 or D3 to D5, since D11 was an attempt to reproduce cables according to the opposed patent and not according to the prior art documents.

(c) Inventive step

Document D5 did not disclose forming a blend of a polyolefin, a cross-linking system and a foaming agent. D5 rather disclosed in general that a silane grafted polyolefin could be used together with a foaming agent. However, a polyolefin with grafted silane-units could not legitimately be considered a blend of polyolefin and a silane-based cross-linking system. D5 also did not disclose that the blend was extruded on the conductor. The wording of claim 1 implied that cross-linking took place in the extruder but in D5 cross-linking took place after extrusion and expansion in the presence of water. D5 also did not disclose the result-effective weight ratio of the foaming agent, which was in a narrow and specific range and had the technical effect of making the cables sturdy yet flexible. The cell size range according to claim 25 was not disclosed in any prior art document. It had the effect of making the cables flexible yet mechanically resistant.

(d) Admissibility of new objection

The new objection of lack of inventive step in view of D1 and D3 was inadmissible. There was no justification for the late stage of the procedure at which this new line of attack was introduced and the respondent could not have been expected to address each and every combination of documents on file. D1 and D3 had always

been on file. By expecting the other parties to prepare for every possible combination the appellant shifted their responsibility to state their complete case to the respondent. The preliminary opinion of the Board did not trigger the new objection. If it were admitted, the respondent would be caught by surprise and would need a sufficient amount of time to address the objection appropriately. The combination of D1 and D3 was not *prima facie* relevant.

Reasons for the Decision

1. The appeal is admissible.

2. *Sufficiency of disclosure*
 - 2.1 The opposed patent discloses the invention in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art.

 - 2.2 The patent itself contains 20 example cables of which ten were fabricated according to the claim limitations. The coating of these ten cables was not only cross-linked, but even cross-linked to a degree allowing them to pass the hot set test. Furthermore, the amounts of foaming agent covered the range of 0.15 to 0.27 wt-%, that is a substantial portion of the claimed range of 0.1 to 0.5 wt-%. The expansion degree of those ten cables covered the range of 4.4 to 34 %, that is, a substantial portion of the claimed range of 4 to 40 %. The opposed patent thus discloses a number of ways of carrying out the claimed invention substantially over

the claimed ranges of amount of foaming agent and expansion degree.

- 2.3 The Board is not convinced by the appellant's argument concerning cross-linking. The method of claim 1 contains the limitation that its insulating coating is cross-linked. This property has to be considered as being continuous in the sense that a polymer can have various degrees of cross-linking. The claim wording is not limited to a certain degree of cross-linking. It is the claims that define the subject-matter for which protection is sought. It might be legitimate to resolve a lack of clarity or an ambiguity in a claim by having recourse to the description. However, the fact that the feature "cross-linked" is not binary in nature is not such an ambiguity or lack of clarity. Hence, the claim cannot be read in the light of the description so as to impose a restriction which is not reflected in the claim wording itself. In the present case the claim is therefore not limited to the production of cables passing the hot set test or showing some minimum degree of cross-linking.

An objection of insufficient disclosure cannot legitimately be based on an argument that the application would not enable a skilled person to achieve a non-claimed technical effect, see T 2001/12, catchword. Therefore, even if the comparative tests were accepted at face value, the argument of the appellant concerning insufficient disclosure cannot succeed. Whether the cables thus produced pass the hot set test is rather a matter to be considered under the provisions of Article 56 EPC. Furthermore, given the discrepancies between the conditions used in the comparative tests summarised in D11 and those specified in the patent and the relevant

data sheets (see section 4.3 below), the Board doubts whether the results of those tests have any relevance to the issue of sufficiency of disclosure.

- 2.4 According to claim 25 and paragraph [0057] the insulating coating "consist[s] essentially" of a layer of expanded, cross-linked polyolefin material. This formulation does not exclude the presence of other layers, such as an unexpanded portion of the layer as claimed in claim 31. In particular it does not exclude a gradient in the foaming cell density. The appellant has not demonstrated to what extent such an embodiment could not be carried out.

- 2.5 Comparing Tables 1 to 4 of the opposed patent it is plain to see that in Table 1 the density and degree of expansion for cables 17* and 18 were accidentally exchanged. Judging from Tables 2, 3 and 4, cable 17* has a density of 0.764 g/cm³ and expansion degree of 15.4%, whereas cable 18 has a density of 0.570 g/cm³ and expansion degree of 38.0%. This is merely an obvious error that has no bearing on the sufficiency of the disclosure of the opposed patent.

3. *Novelty*
 - 3.1 The subject-matter of claim 1 and claim 25 is new in view of the prior art cited by the appellant.

 - 3.2 Claim 1 in view of D1
 - 3.2.1 The subject-matter of claim 1 is new in view of Document D1. D1 is generally concerned with the manufacture of flame-retardant compositions. Assuming the translation submitted by the appellant is correct,

which the respondent did not contest, a skilled person would have to choose from several lists in the general part of the disclosure to arrive at the claimed process, namely

- a list containing foaming agents,
- a list containing cross-linking agents,
- a list containing uses of the foam, and
- a list of production techniques.

While each of the corresponding claimed features is disclosed individually in the lists, their combination as claimed is not directly and unambiguously disclosed in D1.

There is only one specific example in D1 on pages 19 and 20 of the translation. In this example, the cross-linking agent is not a silane-based cross-linking agent but a peroxide, see page 20, line 10, and the material is not disclosed to be extruded and for use as a cable insulation.

- 3.2.2 The appellant's argument did not convince the Board because it fails to demonstrate that the particular combination to which the claim is directed is disclosed directly and unambiguously in the four lists. The fact that the majority of the foaming agents were exothermic does not change the fact that both types are disclosed in D1. While the use of an exothermic foaming agent might be strongly suggested in D1, the disclosure is not direct and unambiguous in this respect.

The passage concerning cables on page 22, lines 10 to 18 of D1 reads "[the composition] is able to be utilized as a cushioning agent, a heat-insulating material, a sound-proofing material, as a coating for a

wire or a cable, as packing or sealing material [...]". Contrary to the appellant's submission, the use of cable coatings is not singled out individually, let alone in combination with the necessary choices from the remaining lists.

The fact that extrusion was a "classical" manufacturing technique is an argument concerning the obviousness of the choice but does not demonstrate that extrusion was disclosed in combination with cable coatings.

All of the above choices additionally have to be combined with a choice from the list of cross-linking agents to arrive at the claimed combination. The fact that this list contains four different groups of cross-linking agents cannot lead to the conclusion that D1 disclosed the particular choice of features as claimed in claim 1.

3.3 Claim 25 in view of D1 and D3 to D5.

The subject-matter of claim 25 is new in view of the documents D1 and D3 to D5. None of these documents discloses the average size of the cells of the expanded product.

The cell size of the insulating coating according to claim 25 is a structural feature, which can be used to distinguish the claimed cables from prior art cables. The result to be achieved is rather to be seen in the increase in flexibility that the cells cause. The claimed average cell size can therefore not simply be ignored in the assessment of novelty as was proposed by the appellant.

The fact that all comparative cables from document D11 had a cell size falling in the claimed range does not justify the appellant's conclusion that the cell sizes of the foamed composition of the prior art documents fell in that range. D11 covers 18 different comparative cables. The variations in parameters and starting materials used are not systematic enough so as to allow the appellant's conclusion. It has to be borne in mind that D11 is an attempt to reproduce the claimed subject-matter rather than any of the prior art disclosures according to D1 or D3 to D5. It can therefore not be concluded that an average cell size of less than 300 μm would occur in any or every prior art foamed polyolefin.

4. *Inventive step in view of the comparative tests*

4.1 The subject-matter of claim 1 involves an inventive step in view of the comparative tests alone.

4.2 The appellant argued that the comparative tests of D11 alone showed that the subjective technical problem was not solved across the whole breadth of claim 1. This in itself showed that the claimed subject-matter lacked an inventive step. The Board is not convinced by this argument. In the context of the problem-solution approach, the closest prior art is identified and in view of the distinguishing features of a claim an objective technical problem has to be defined, which may very well be different from the subjective technical problem indicated in the description. It is not sufficient to show that the subjective problem is not solved. Rather, it would have been incumbent on the appellant to define correctly a potentially less

ambitious objective problem and demonstrate that the solution to this problem would have been obvious.

- 4.3 Furthermore, the Board is not convinced that the comparative tests actually demonstrated that the subjective technical problem was not solved across the whole claimed range.

The four temperature profiles in the extruder used to manufacture the comparative examples in D11 neither followed the recommendations of the manufacturer data sheets for the base polymers, see D12 and D13, nor did they correspond to the temperature profile in the opposed patent. The temperature profile according to the opposed patent was from 160°C at the beginning of the barrel to 240°C in the head. According to D12 the temperature profile from barrel to die should be in the range starting at 180°C to 230°C. According to D13 it should be from 150°C at the beginning of the barrel to 245°C in the die. The temperature profiles 1 and 3 of the comparative tests on the other hand were substantially lower. Temperature profile 2 was similar to that recommended in D12 but covered a much smaller range than that of the patent, starting 30°C higher at the beginning of the barrel. It appears that only a single comparative cable, cable 18 of D11, shows a temperature profile comparable to that of the opposed patent, but had yet other parameters varied, such as the use of a linear low-density polymer. The appellant did not explain why the temperature profiles were chosen in that way. They rather contended that the data sheets merely contained recommendations that did not have to be followed.

To the Board this statement is surprising and hard to accept. According to the data sheets D12 and D13, both

polymers should, upon proper preparation, pass the hot set test and show the desired tensile strength. Two out of the three polymers are specifically marketed for cable coatings. A skilled person can expect the finished polymers to have the advertised properties if he follows the manufacturers' recommendations. Deviations from these recommendations might also lead to acceptable finished cables but there is clearly neither a guarantee nor always a reasonable expectation of success. It is incumbent on the appellant to demonstrate that it is not these very deviations that cause the cables' failure to show the expected properties. They did not provide evidence in this respect. Thereby the appellant introduced various potential causes for the unexpected failure of their comparative tests rendering it impossible for the Board and the other party to draw any conclusions as to the exact nature of the causes. Thus by deviating from the data sheet recommendations they significantly reduced the probative values of the comparative tests.

Furthermore, one of the cross-linking systems, SILFIN 53, contains an antioxidant, which acts as an electron scavenger and has the potential to inhibit the cross-linking reaction, which relies on free radicals. To the Board's knowledge, it is possible to add such antioxidants and still obtain cross-linked polymers if an increased amount of peroxide is provided. However, data as to the amount of peroxide used in the comparative tests was not supplied by the appellant. The respondent showed a counter-example in D23 in which sufficient cross-linking was achieved but with a different polymer and a different cross-linking system. Therefore, due to the simultaneous variation of various parameters, neither test has a high probative value.

Due to the additional elements of uncertainty introduced in these tests by incomplete information and deviations from recommended temperature profiles, the tests are not suitable to support the conclusion that the technical problem is not solved across the whole claimed range.

5. *Inventive step in view of D5*

5.1 The subject-matter of claim 1 involves an inventive step in view of D5 assessed in view of D11 and D5 in combination with D1 or D2.

5.2 Closest prior art

The parties agreed that the cable and its process of manufacture according to document D5 was a suitable starting point for the assessment of inventive step of the subject-matter of claim 1 and claim 25. The Board accepts this choice.

5.3 Teaching of D5

It was common ground between the parties that D5 discloses cables with increased flexibility and peeling-off properties, see page 1, lines 3 to 4, as well as their process of manufacture, see page 18, line 11 to page 20, line 32 and page 23, line 29 to page 25, line 9. The cables have two layers of polymer, one of the layers being foamed, see page 12, lines 22 to 34. Both layers are co-extruded on the conductor of the cable, see page 24, lines 5 to 8. The only preferred embodiment uses PVC for both layers. PVC is not a polyolefin and is not disclosed to be cross-linked, see

page 24, lines 8 to 19 in conjunction with Tables 1 and 2.

D5 discloses on page 20, lines 12 to 32 that the foamed layer can undergo cross-linking. The use of polyolefin and silanes is mentioned in this context as well as cross-linking being effected in the presence of water and a cross-linking catalyst.

5.4 Distinguishing features

The following features distinguish the process of claim 1 from that of D5:

- (i) providing a *polyolefin* material and a *silane-based cross-linking system* and an exothermic foaming agent *in an amount of from 0.1% to 0.5% by weight with respect to the total weight of polyolefin*
- (ii) forming a blend of *polyolefin material, and the silane-based cross-linking system*

There is no explicit disclosure of replacing PVC in the embodiment of D5 by polyolefin and cross-linking the polyolefin. According to Tables 1 to 3 and page 24, lines 8 to 19 of D5, two exothermic foaming agents are provided, according to the Board's calculations in a weight ratio of 0.1 wt-% with respect to the total weight of PVC. (The masterbatch of Table 2 contains 45 wt-% of PVC and is mixed with 1.2 wt-% of the masterbatch of Table 3. The latter contains 40 wt-% foaming agent and 60 wt-% PVC.) However, no information can be found as to what amount of exothermic foaming agent would have to be used if PVC were to be replaced by polyolefin or cross-linked polyolefin.

5.5 Technical problem

Both parties agreed that the subjective technical problem mentioned in the patent was also the objective technical problem. The Board understands this to refer to the problem stated on page 6, lines 39 to 43 of the opposed patent, namely to confer to the insulating coating a suitable mechanical resistance without decreasing the flexibility. The Board sees no reason to deviate from this assessment.

5.6 Assessment of the solution

5.6.1 *D5 in view of the comparative tests*

The appellant argued again that starting from D5, the comparative tests of D11 showed that the objective technical problem was not solved. However, because of the above mentioned lack of probative value of the tests, the Board is not convinced by this argument.

5.6.2 *D5 in view of D1*

Document D5 does not contain any teaching concerning the circumstances under which the outer foamed PVC layer should be replaced by foamed and cross-linked polyolefin. The only disclosure of D5 concerning cross-linking is on page 20, lines 12 to 14, according to which "[f]urthermore, the expanded polymeric material of the cable insulating layer of the insulating coating can undergo a cross-linking process" and on page 11, lines 29 to 33, according to which "[t]he expanded polymeric material of the expanded insulating layer comprises at least one expandable polymer. If necessary said polymer, after expansion, can be crosslinked [...]"

The objective of D5 is to provide cables that are flexible yet have a suitable resistance and which can be peeled-off easily. This is achieved by using a bilayer of non-foamed and foamed PVC. To the Board, the teaching of D5 does not contain any suggestion for the skilled person as to the manner in which replacing the outer foamed PVC layer of the cable by a foamed and cross-linked polyolefin layer might ensure the same desirable combination of easy peel-off, flexibility and mechanical resistance. This is aggravated by the fact that the degree of foaming of the outer layer is disclosed only in the context of PVC layers. The Board cannot recognise any teaching as to how the amount of foaming agent should be adapted if a polyolefin were used instead of PVC. The Board are not saying that once a skilled person has decided to replace foamed PVC by foamed and cross-linked polyolefin they could not find a suitable amount of foaming agent by routine trial, but merely that the complete absence of any teaching regarding how the amount of foaming agent should be adapted adds to the lack of motivation for a skilled person to decide to modify the teaching of D5 as required by claim 1.

The appellant has shown that a skilled person could have modified the teaching of D5 but failed to convince the Board that he would have done so. For these reasons alone, the Board has doubts that the subject-matter of the claim lacks an inventive step.

The appellant further argued that the only distinguishing feature when starting from D5 was the amount of foaming agent. D1 disclosed the manufacture of foamed and cross-linked polyethylene with a foaming agent of 0.1% by weight. The Board is not convinced by

this assessment because it ignores further distinguishing features. To the Board, D5 itself does not motivate the skilled person to replace foamed PVC by cross-linked and foamed polyolefin. Adducing document D1 for an appropriate amount of a foaming agent already presupposes that the skilled person has decided to do just that.

Furthermore, the appellant argued that D1 suggested using 0.1% by weight of foaming agent because it disclosed a range of 0.1 to 15% by weight. It is true that in the context of the assessment of novelty, the end point of a range, such as 0.1% would be considered to be disclosed in D1. In the present case, however, the question to be answered is whether D1 suggests such an amount in the context of the cables of D5. D1 discloses on page 3, lines 27 to 36 a number of alleged beneficial properties of its composition in rather general terms. Flexibility is mentioned alongside "mechanical characteristics" and "electrical characteristics". The Board has considerable doubt that a skilled person starting from a cable with a PVC outer layer that strikes a good compromise between flexibility, mechanical resistance and peel-off would find any motivation to replace PVC by polyolefin in the general and vague terms "mechanical and electrical characteristics" used in D1, which are not even specifically directed to cable coatings.

The range of the amount of foaming agent in D1 is rather broad. The Board cannot see any teaching that would lead the person skilled in the art to use the lower end point of said range. On page 13, lines 24 to 27, D1 explicitly states that 0.1 wt-% or less is undesirable because it precludes the production of satisfactory foam. Again, the Board is of the opinion

that the skilled person could in principle systematically vary the amount of foaming agent in the range between 0.1 wt-% to 15 wt-% once they have decided to replace PVC. However, he would have to vary the type of polymer and a great number of other parameters at the same time. The Board can therefore still not see what could motivate a decision to do so, since absolutely no such indication is apparent, either from D5 or from D1, that the whole exercise would end in success, let alone have any benefit.

5.6.3 *D5 in view of D2*

The appellant raised the objection of lack of inventive step starting from D5 in view of D2 for the first time in their letter dated 2 August 2019 but did not make any further submissions during the oral proceedings. It follows from the conclusion of the first part of paragraph 5.6.2 above, according to which the appellant has not demonstrated that the skilled person would replace PVC by polyolefin in D5, that also the combination with document D2 would not lead to the subject-matter of claim 1 in an obvious manner. In view of this conclusion, it was not necessary to discuss the admissibility of this objection.

6. Inventive step of claim 25

6.1 The subject-matter of claim 25 involves an inventive step.

6.2 The appellant argued that the claimed cell size was merely a random choice, because Table 4 of the opposed patent did not allow any conclusion to be drawn as to the technical effect of this feature. However,

according to Figure 2 and page 11, lines 41 to 43 of the patent, too large a cell size causes uneven expansion. While the teaching of the patent is not systematic in this respect, the appellant merely ignored avoidance of uneven expansion in their assessment. The comparative tests again merely had an uncertain probative value in this respect. None of the prior art documents disclosed the claimed cell size range. The choice of cell size is therefore purposeful and non-obvious.

7. *Admissibility of a late-filed inventive step objection*

7.1 The Board exercised their discretion not to consider the late filed objection of lack of inventive step in view of D1 and D3.

7.2 The appellant raised this objection for the first time in the oral proceedings before the Board. The documents form part of the appeal proceedings.

7.3 The objection represents an amendment to the appellant's case and may as such, pursuant to Article 13(1) RPBA, be admitted and considered at the Board's discretion. Document D1 and D3 had up to that point only been used to support objections of lack of novelty of claim 1 and claim 25. At least the allegation that they led, in combination, to a lack of inventive step is to the Board a new fact.

7.4 The appellant did not present a convincing justification for the late submission of this alleged new fact. The Board's preliminary opinion on the disclosure of D1 did not introduce any new aspects into the discussion. It merely did not follow the

appellant's conclusions. Even accepting *arguendo* that it did prompt the new objection, the appellant did not give any reason for presenting that attack only towards the end of the oral proceedings rather than at such a time before the oral proceedings as to allow the Board and the respondent to appropriately address it. The annex to the summons stated clearly that any further comments, documents or requests should be at the disposal of the Board and the other party one month before the oral proceedings at the latest and should not surprise the other party and the Board. The respondent indicated that he would need an appropriate amount of time to react to the objection. Admittance of the objection at this late stage would therefore not have respected the required procedural efficiency. Rather it might even have borne the risk of having to adjourn the oral proceedings. Even if one accepted that D1, having been cited to support an objection of lack of novelty, could have been expected to be used as a starting point for an objection of lack of inventive step, the other party cannot be expected to anticipate any arbitrary combination of D1 with other documents on file, such as D3, to be introduced into the proceedings. Furthermore, a document useful for assessing novelty is not necessarily a legitimate choice as closest prior art, see also T0181/17, reasons 7.4.

8. For the above reasons, the Board accedes to the respondent's main request and rejects the appellant's request.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:



U. Bultmann

R. Lord

Decision electronically authenticated