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**Datasheet for the decision
of 30 June 2023**

Case Number: T 1871/19 - 3.3.03

Application Number: 11805016.0

Publication Number: 2794771

IPC: C09D5/08

Language of the proceedings: EN

Title of invention:

CORROSION RESISTANT EQUIPMENT FOR OIL AND/OR GAS APPLICATIONS

Patent Proprietor:

Tenaris Connections B.V.

Opponent:

VALLOUREC OIL AND GAS FRANCE

Relevant legal provisions:

EPC Art. 56, 83

Keyword:

Inventive step - synergistic effect (yes) - obvious solution
(no)

Sufficiency of disclosure - (yes)



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Case Number: T 1871/19 - 3.3.03

D E C I S I O N
of Technical Board of Appeal 3.3.03
of 30 June 2023

Appellant 1: Tenaris Connections B.V.
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Appellant 2: VALLOUREC OIL AND GAS FRANCE
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Decision under appeal: **Interlocutory decision of the Opposition
Division of the European Patent Office posted on
17 April 2019 concerning maintenance of the
European Patent No. 2794771 in amended form.**

Composition of the Board:

Chairman D. Semino
Members: M. Barrère
A. Bacchin

Summary of Facts and Submissions

- I. The appeals of the patent proprietor and of the opponent lie against the interlocutory decision of the opposition division concerning maintenance of European Patent number 2 794 771 in amended form on the basis of the claims of auxiliary request 1 filed during the oral proceedings on 12 March 2019. The decision was also based on the granted claims as main request.
- II. The following documents were *inter alia* cited in the decision of the opposition division:
- D2: Zinc-Rich Primers with Micaceous Iron Oxide, article from Paint & Coating Industry (PCI) published on 28 April 2004
 - D3: "MIO Coatings - What Are They?", Dulux® Protective coatings technical information and advice, September 2009
 - D4: US 5,749,946
 - D18: Effect of the fluorine-containing polymer, Experimental report filed by the patentee with letter of 10 January 2019
 - D22: Product News, "Fuorolink® D10H and Fluorolink® E10 H PFPE: Innovative Additives from Solvay Solexis for improving the Performance of Polymeric Materials", 28 August 2009
 - D23: "Fluorolink Polymer Modifiers", Product Data Sheet from Solvay Solexis, 2002
- III. In that decision the opposition division held, among others, that:

- Auxiliary request 1 met the requirement of sufficiency of disclosure.
- The subject-matter of claim 1 of auxiliary request 1 involved an inventive step over D3, D5 or D11 as the closest prior art.

IV. The patent proprietor (appellant 1) and the opponent (appellant 2) filed an appeal against said decision.

V. With their statement of grounds of appeal, appellant 1 filed fourteen sets of claims as auxiliary requests 1 to 14.

VI. Oral proceedings were held before the Board on 30 June 2023.

VII. The final requests of the parties were the following:

Appellant 1 requested that the decision under appeal be set aside and that the patent be maintained on the basis of auxiliary request 7, filed with the statement of grounds of appeal.

Appellant 2 requested that the decision under appeal be set aside and the patent be revoked.

VIII. Claim 1 of auxiliary request 7 read as follows:

"1. Equipment for oil and/or gas drilling, completion, storage and transportation, including pressure vessels, tools, pipes, tubes, connections and any other parts coated with a coating as a barrier against gaseous or liquid corrosive environments comprising

a) a cured binder comprising at least one cured cross-linkable resin chosen from polyepoxides, phenolic resin, phenoxy resin, aminoplast resin, polyurethane resin derived from polyisocyanates and/or acrylic resin, wherein the resin comprises at least one polar group comprising hetero atoms selected from the group including nitrogen, oxygen, sulfur and phosphorus;

b) at least one type of hydrophilic flakes with an aspect ratio of more than 10, wherein the surface of the flakes at least partially comprises a metal oxide,

wherein the coating further comprises a fluorine-containing polymer or oligomer."

The remaining claims of the request are not relevant to the present decision.

IX. Appellant 1's submissions, in so far as they are pertinent to the present decision, may be derived from the reasons for the decision below. They were essentially as follows:

(a) Inventive step

The subject-matter of claim 1 of auxiliary request 7 involved an inventive step over D3 as the closest prior art.

(b) Sufficiency of disclosure

The skilled person knew how to obtain a resin with a polar group comprising a phosphorous atom. The opposed

patent was therefore sufficiently disclosed over the whole scope of the claims.

X. Appellant 2's submissions, in so far as they are pertinent to the present decision, may be derived from the reasons for the decision below. They were essentially as follows:

(a) Inventive step

The subject-matter of claim 1 of auxiliary request 7 lacked an inventive step over D3 as the closest prior art.

(b) Sufficiency of disclosure

The opposed patent did not teach how to obtain a resin with a polar group comprising a phosphorous atom and was therefore insufficiently disclosed over the whole scope of the claims.

Reasons for the Decision

Auxiliary request 7

1. Inventive step

According to appellant 2, the subject-matter of claim 1 of auxiliary request 7 lacks an inventive step in view of D3 combined with D2 and D22/D23 or in view of D3 combined with D4 and D22/D23 (see rejoinder of appellant 2, point VII.2. with back reference to points VI.3.1 and VI.3.2 and letter of 26 November 2020, point VI.).

1.1 Closest prior art

1.1.1 Appellant 1 considers that D3 is not a suitable starting point to evaluate inventive step for the subject-matter of claim 1. In particular the primary object of this document would be the provision of coatings for decorative purposes or high traffic areas and not of corrosion resistant coatings.

1.1.2 Given that the Board concluded that claim 1 involved inventive step even if D3 was chosen as the closest prior art, appellant 1 was not adversely affected by that choice.

However, for the sake of completeness, the following brief reasons are given to justify the choice of D3 as starting point for the assessment of inventive step of the subject-matter of present claim 1:

1.1.3 According to established case law, a central consideration in selecting the closest prior art is that it must be directed to the same purpose or effect as the invention (see Case Law of the Boards of Appeal, 10th edition 2022, in the following "Case Law", I.D. 3.2).

The opposed patent concerns coatings designed for protecting oil and gas drilling equipment from corrosive substances (see paragraph [0001]). Contrary to appellant 1's view, D3 pertains primarily to coatings which are used to protect steel against corrosion in the presence of oxygen, water and salts (see D3, page 1, third paragraph and figures). In addition, D3 discloses that an example of said coatings has been used to protect North Sea oil rigs, which the

Board considers to be an oil and/or gas drilling equipment (see D3, page 2, first paragraph, right-hand column, second bullet point).

1.1.4 Therefore, as D3 is closely related to the technical field and to the purpose of the opposed patent, it is considered to be a reasonable starting point for assessing the inventive step of the subject-matter of claim 1.

1.2 Distinguishing features

1.2.1 Appellant 2 holds that the subject-matter of claim 1 differs from D3 in that the coating further comprises :

- (i) hydrophilic flakes having an aspect ratio of more than 10 (the aspect ratio not being known in D3) and
- (ii) a fluorine-containing polymer or oligomer (emphases here and below added by the Board).

Appellant 1 does not dispute the above distinguishing features, but is of the opinion that D3 does not disclose:

- (iii) a gas or oil drilling equipment coated with Micaceous Iron Oxide (MIO) flakes and
- (iv) a cured resin as defined in claim 1.

which would then be further distinguishing features.

1.2.2 Since the Board concluded that claim 1 involved an inventive step on the basis of distinguishing features (i) and (ii) alone, the actual presence of these further alleged distinguishing features cannot affect

that conclusion and is, therefore, not relevant to the decision.

1.2.3 Hence, for the purpose of the assessment of inventive step, the Board agrees with distinguishing features (i) and (ii) identified by appellant 2.

1.3 Technical problem

1.3.1 Appellant 1 relies on the experimental evidence presented in D18 to show that the combination of

hydrophilic flakes having an aspect ratio of more than 10 (corresponding to distinguishing feature (i)) with

a fluorine-containing polymer or oligomer (corresponding to distinguishing feature (ii))

would result in a coating composition having improved barrier properties (see D18, page 5, figure 9 and 10). Furthermore, the degree of improvement would indicate that a synergistic effect was present.

On this basis, appellant 1 considers that the objective problem to be solved should be defined as to improve the barrier effect of the coating in an oil and/or gas equipment (see rejoinder of appellant 1, page 12, antepenultimate paragraph).

1.3.2 According to appellant 2, the experimental data of D18 illustrate a very specific embodiment of the claimed invention (using two specific cured binders and only in the presence of a rheology additive). For this reason, it would not be credible that any problem was solved over the whole scope of claim 1 of auxiliary request 7.

1.3.3 The Board notes that appellant 2 does not contest that the experimental data provided in figures 9 and 10 of D18 show a synergy of the combination of hydrophilic flakes having an aspect ratio of more than 10 (LS) with the fluorine-containing polymer (D10H) (which means that the combined action of the two components on the barrier properties is much larger than the sum of their individual effects). The Board has also no reason to dispute this part of the evaluation of D18.

However, as noted above, appellant 2 essentially argues that the experimental data relate to a very specific embodiment of the claimed invention but are not sufficient to make it credible that the said synergy was achieved over the whole scope of claim 1.

1.3.4 According to established case law, if comparative tests are chosen to demonstrate an inventive step on the basis of an improved effect over a claimed area, it should be credible that this effect was achieved over the whole range claimed (see Case Law, I.D.4.3.1).

The Board acknowledges that the experimental evidence D18 relates to specific compositions comprising an epoxy resin (as curable binder) and a particular rheology additive. However the relevant question is whether it is credible that the synergy (observed for these compositions) may be obtained over the whole scope of claim 1.

In the present case, the Board has *prima facie* no reason to believe that the nature of the binder should have an effect on the results. Furthermore, no evidence to the contrary has been provided by appellant 2. Therefore, it is at least credible that a synergistic

improvement of the barrier properties would be observed independently of the binder used.

Similar considerations apply to the rheology additive. While all examples of D18 contain a specific rheology additive, the Board sees *prima facie* no reason why the synergistic improvement would not be achieved in the absence of the said additive.

- 1.3.5 At the oral proceedings, appellant 2 further argued that if an effect were to be accepted on the basis of D18, it should be limited to the barrier properties in the presence of a corrosive liquid, such as an aqueous solution of NaCl (see D18, page 3, point 2.).

Appellant 1 requested that this new line of attack not be admitted into the proceedings, as it was late-filed and not sufficiently substantiated.

For the Board, whether the problem to be solved is limited to barrier properties against corrosive liquids (instead of corrosive liquids and gases as argued by appellant 1) is not relevant to the conclusion under inventive step. In other words, even following appellant 2's arguments, the Board - as explained below - still concluded that an inventive step could be acknowledged. Therefore, the question of the admittance of this line of attack does not need to be addressed.

Consequently, for the benefit of appellant 2 (as the losing party), the Board merely assumes that the effect shown in D18 is indeed limited to the barrier properties against corrosive liquids.

- 1.3.6 In conclusion the Board holds that D18 provides sufficient evidence that the combination of

hydrophilic flakes having an aspect ratio of more than 10 (corresponding to distinguishing feature (i)) with

a fluorine-containing polymer or oligomer (corresponding to distinguishing feature (ii))

results in a synergistic improvement of the coating barrier properties against corrosive liquids.

1.3.7 The problem to be solved is therefore formulated as the provision of a coating having synergistically improved barrier properties against corrosive liquids.

1.4 Obviousness

It remains to be evaluated whether it was obvious to the skilled person wishing to provide a coating having synergistically improved barrier properties against corrosive liquids, to use a coating composition comprising in combination

hydrophilic flakes having an aspect ratio of at least 10 (distinguishing feature (i)) and

a fluorine-containing polymer or oligomer (distinguishing feature (ii)).

1.4.1 Appellant 2 essentially considers that it was obvious in view of D2, D3 and D4 to use hydrophilic flakes having an aspect ratio of at least 10 in order to improve the coating barrier properties. The same would apply to the use fluorine-containing polymer or oligomer with regard to the teaching of D22 and D23.

1.4.2 Appellant 1 holds that the cited documents would not teach that the hydrophilic flakes as defined in claim 1 could act in synergy with the fluorine-containing polymer or oligomer in order to improve the coating barrier properties.

1.4.3 To the benefit of appellant 2, the Board does not contest that the skilled person could have expected that an increase of the flake aspect ratio (distinguishing feature (i)) was advantageous in order to improve the barrier properties of a coating against corrosive substances. In that respect reference is made to D3, page 1, last paragraph. Similarly, there are some indications in D22 and D23 which could have led the skilled person to the conclusion that a fluorine-containing polymer or oligomer is advantageous for improving the barrier properties (see for instance D23, page 2, key properties of protective coatings).

However, the question to be answered is whether the skilled person could have expected an improvement in barrier properties going beyond the expected improvement associated with distinguishing features (i) and (ii) individually.

In agreement with appellant 1, the Board cannot recognise in documents D2, D3, D4, D22 and D23 any teaching which could have led the skilled person to anticipate a synergy between distinguishing features (i) and (ii). While these documents might suggest to use features (i) and (ii) individually, it is not derivable therefrom that the combination of the two could provide an effect going beyond the sum of their individual effects.

1.4.4 For these reasons, it was not an obvious option for the skilled person wishing to provide a coating having synergistically improved barrier properties to use a combination of hydrophilic flakes having an aspect ratio of at least 10 (distinguishing feature (i)) and a fluorine-containing polymer or oligomer (distinguishing feature (ii)).

1.5 Consequently, the subject-matter of claim 1 of auxiliary request 7 involves an inventive step over D3 as the closest prior art.

2. Sufficiency of disclosure

2.1 According to appellant 2, the opposed patent does not teach how to prepare a "resin comprising a polar group with a phosphorous acid", which is a feature of the claims. Therefore, the invention would be insufficiently disclosed over the whole scope of claims (see point 2.1 of the statement of grounds of appeal).

2.2 In agreement with the opposition division, appellant 1 holds that the skilled person is able (based on common general knowledge) to prepare resins with phosphorous containing groups (see rejoinder of appellant 1, pages 3 and 4).

2.3 With regard to the question of sufficiency, it is first pointed out that a successful objection of lack of sufficient disclosure presupposes that there are serious doubts, substantiated by verifiable facts (see Case Law, II.C.9). While it is acknowledged that the opposed patent does not provide any example of a resin comprising a phosphorous group, the patent would only be insufficiently disclosed if the skilled person would

not know, based on common general knowledge, how to obtain said resin.

However, for the Board it is notorious that resins with polar phosphorous containing groups are known in the art. There is little doubt that the skilled person (who is a chemist) should be able to prepare said resins even in the absence of corresponding examples in the patent. Therefore the mere allegation that the patent would be insufficiently disclosed in view of said resins is not sufficient to raise serious doubts.

- 2.4 Consequently, appellant 2's arguments do not provide any reason for the Board to deviate from the conclusion of the opposition division (see point II.5.3 of the decision under appeal).

3. As all objections to auxiliary request 7 are unsuccessful, there is no need to deal with any further issues and the patent is to be maintained on the basis of this request.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the opposition division with the order to maintain the patent on the basis of claims 1 to 18 filed as auxiliary request 7 with the statement of grounds of appeal, after any necessary consequential amendment of the description.

The Registrar:

The Chairman:



D. Hampe

D. Semino

Decision electronically authenticated