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Datasheet for the decision of 27 November 2012

Case Number: T 2237/10 - 3.3.09

Application Number: 04762857.3

Publication Number: 1663637

IPC: B32B 1/08, B32B 27/08, F16L 9/12

Language of the proceedings: EN

Title of invention:
A flexible unbonded pipe and a method for producing such pipe

Patent Proprietor:
National Oilwell Varco Denmark I/S

Opponent:
Technip France SA

Headword:
-

Relevant legal provisions:
EPC Art. 54, 83, 123

Keyword:
"Added subject-matter - no"
"Sufficiency - yes"
"Novelty - yes"
"Remittal - yes"

Decisions cited:
G 0002/10, T 1511/07, T 0812/09, T 0978/99, T 0301/81

Catchword:
-

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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 2237/10 - 3.3.09

D E C I S I O N
of the Technical Board of Appeal 3.3.09
of 27 November 2012

Appellant: (Patent Proprietor)
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Decision under appeal:
Decision of the Opposition Division of the European Patent Office posted 15 October 2010 revoking European patent No. 1663637 pursuant to Article 101(3)(b) EPC.

Composition of the Board:

Chairman: W. Sieber
Members: J. Jardón Álvarez
K. Garnett

Summary of Facts and Submissions

I. This decision concerns the appeal filed by the patent proprietor against the decision of the opposition division to revoke European patent No. 1 663 637 in the name of NKT Flexibles I/S (now National Oilwell Varco Denmark I/S).

II. The patent was granted with 46 claims, independent claims 1 and 39 reading as follows:

"1. A flexible unbonded pipe comprising at least one polymer layer having a thickness of 4 mm or more and one film layer having a thickness of 1 mm or less, said polymer layer being at least 10 times as thick as the film, said film layer provides a fluid permeation barrier against one or more of the fluids methane, hydrogen sulphides, carbon dioxide and water, which is higher than the fluid permeation barrier provided by the polymer layer determined at 50°C and a pressure difference of 50 bars, and said polymer layer being bonded to said film layer."

"39. A method of producing a flexible unbonded pipe as defined in any one of the claims 1-38, said method comprising the steps of providing at least one polymer layer having a thickness of 4 mm or more and at least one film layer having a thickness of 1 mm or less, said polymer layer being at least 10 times as thick as the film, said film layer provides a fluid permeation barrier against one or more of the fluids methane, hydrogen sulphides, carbon dioxide and water, which is higher than the fluid permeation barrier provided by the polymer layer determined at 50°C and a pressure

difference of 50 bars, and bonding said layers to each other."

Claims 2 to 38 and 40 to 46 were dependent claims.

III. A notice of opposition was filed against the patent by Technip France (opponent) on 26 May 2009 requesting revocation of the patent in its entirety based on Article 100(a) EPC (lack of novelty and inventive step) and Articles 100(b) and (c) EPC.

The documents cited during the opposition proceedings included:

D5: WO 86/07432 A1;

D6: GB 2 385 399 A;

D15: B. Flaconnèche *et al.*, "High Pressure Permeation of Gases in Semicrystalline Polymers: Measurement Method and Experimental Data", without publication data;

D16: WO 03/044414 A1;

D17: Z. Benjelloun-Dabaghi *et al.*, "MOLDI™: A fluid permeation model to calculate the annulus composition in flexible pipes"; without publication data;

D18: "Specification for Subsea Production Control Umbilicals", American Petroleum Institute Specification 17E, Second Edition September 1, 1998; and

D19: "Specification for Unbonded Flexible Pipe", American Petroleum Institute Specification 17J, Second Edition November 1999; Effective Date: July 1, 2000.

IV. With its decision announced orally on 16 September 2010 and issued in writing on 15 October 2010, the opposition division revoked the patent.

The decision was based on the claims of the patent as granted (main request) and on seven auxiliary requests filed with letter of 12 July 2010 and filed again during the oral proceedings to correct a typing error.

The opposition division decided:

- Not to admit late-filed documents D15-D18 into the proceedings, essentially because they were *prima facie* not relevant as to the outcome of the proceedings. Additionally D15 carried no publication date and there was no evidence that it had been made publically available;

- To admit late-filed document D19 into the proceedings as it appeared *prima facie* relevant to show how permeability could be measured, and because it had been filed in response to an objection made by the opponent shortly before the oral proceedings and, therefore, could not have had been filed earlier;

- That the subject-matter of claim 1 of all requests extended beyond the content of the application as

originally filed (Article 123(2) EPC), essentially because the combination of the required thickness of the film and the polymer layer, and the ratio between them, could not be derived from the application as filed;

– That the invention as set out in the granted patent and auxiliary requests 1 to 7 respectively was not disclosed in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art (Article 83 EPC), because it would constitute an undue burden for a skilled person to test the barrier properties of the two layers with any possible method, in all the possible constructions covered by claim 1, for all possible materials and for the fluids mentioned in claim 1, and because the skilled person would not know how to implement the feature "said polymer layer being bonded to the film layer";

– That the disclosure of document D5 was novelty-destroying for the subject-matter of claim 1 of the patent as granted and claim 1 of auxiliary requests 1 to 3 and 7 (Article 54 EPC); and

– That the subject-matter of claim 1 of auxiliary requests 4 to 6 was not clear, contrary to the requirements of Article 84 EPC.

The issue of inventive step was not dealt with in the decision.

V. On 29 October 2010 the patent proprietor (in the following: appellant) lodged an appeal against the

decision of the opposition division and paid the prescribed fee on the same day. With the statement setting out the grounds of appeal, filed on 9 February 2011, the appellant requested that the decision under appeal be set aside and that the patent be maintained as granted, alternatively on the basis of the first to seventh auxiliary requests filed during the oral proceedings before the opposition division.

The appellant further requested that if the board applied decision T 1511/07 against the maintenance of the patent as granted two questions relating to the allowability of amendments in the context of Article 123(2) EPC be referred to the Enlarged Board of Appeal.

VI. With its reply dated 8 June 2011 the opponent (in the following: respondent) disputed all the arguments submitted by the appellant and requested that the patent be revoked in its entirety. The opponent further requested that documents D15 to D18 be admitted into the proceedings and filed the following further documents in support of this request:

D15A: B. Flaconnèche *et al.*, "High Pressure Permeation of Gases in Semicrystalline Polymers: Measurement Method and Experimental Data"; Oilfield Engineering with Polymers 3rd MERL Conference, 28-29 November 2001, pages 81-97;

D15B: Internet page http://www.ismithers.net/publishing dated 25/05/2011 (3 pages); and

D17A: Z. Benjelloun-Dabaghi *et al.*, "MOLDI™: A Fluid Permeation Model to Calculate the Annulus Composition in Flexible Pipes"; Oil & Gas Science and Technology-Rev. IFP, Vol. 57, 2002, pages 177-192.

VII. Further submissions were filed by the appellant with letter dated 21 November 2011 and by the respondent with letter dated 5 April 2012. The appellant also filed document D20:

D20: "Handbook of Polymer Blends and Composites", Volume 2, Editors: A. Kulshershtha and C. Vasile, Rapra Technology Limited, 2002, pages 284-288.

VIII. On 18 May 2012 the board dispatched the summons to attend oral proceedings. In the attached communication the board indicated the points to be discussed during the oral proceedings. The board also expressed its preliminary intention not to refer the appellant's questions to the Enlarged Board of Appeal, because the board did not see any dichotomy in the case law. Whether in other cases boards had decided in favour of or against a claimed combination of features was the result of the evaluation of each individual case on its own merits and applying the requirements developed in the jurisprudence of the boards of appeal of the EPO, namely as to whether or not a claimed combination was directly and unambiguously derivable from the application as filed. Furthermore, the subject-matter of claim 1 of the main request lacked novelty in view of the disclosure of document D5.

IX. Further submissions were filed by the appellant with letter dated 25 October 2012 including an amended first auxiliary request and by the respondent with letters dated 26 October 2012 and 13 November 2012.

X. Oral proceedings before the board were held on 27 November 2012. After the discussion of the various requests and after the board had indicated that the subject-matter of the claims of the sixth auxiliary request fulfilled the requirements of Articles 123, 83 and 54 EPC, the appellant withdrew the main request and the first to fifth auxiliary requests and maintained as its only requests the sixth and seventh auxiliary requests, both filed with the statement of grounds of appeal. Claim 1 of the sixth auxiliary request reads as follows:

"1. A flexible unbonded pipe comprising at least one polymer layer having a thickness of 4 mm or more and one film layer having a thickness of 1 mm or less, said polymer layer being at least 10 times as thick as the film, said film layer provides a fluid permeation barrier against one or more of the fluids methane, hydrogen sulphides, carbon dioxide and water, which is higher than the fluid permeation barrier provided by the polymer layer determined at 50°C and a pressure difference of 50 bars, and said polymer layer being bonded to said film layer with interfacial bonding between the polymer layer and the film layer which is sufficiently strong to prevent creation of gas pockets between the layers when subjected to an increased carbon dioxides pressure on the film side of the pipe, the increased carbon dioxides pressure being 1 bar."

Claims 2 to 37 are dependent on claim 1 and claims 38 to 45 are directed to a method of producing the flexible unbonded pipe of claims 1 to 37.

XI. The arguments presented by the appellant, insofar as they are relevant for this decision, may be summarised as follows:

– The combination of the features of granted claim 1 (and consequently of claim 1 of the sixth auxiliary request) added no new information for the skilled person in addition to what he could directly and unambiguously derive from the application as filed. The subject-matter of claim 1, in particular the combination of a polymer layer having a thickness of 4 mm or more, a film layer having a thickness of 1 mm or less and the polymer layer being at least 10 times thicker as the film layer, could be derived implicitly from the features of claims 1, 19, 20 and 21 of the application as filed. Claim 1 did not comprise a new, narrower sub-range emerging from a selection of explicitly disclosed borderline values as in decision T 1511/07 cited by the opposition division.

– A person skilled in the art working with unbonded flexible pipes was used to the requirements for testing the individual layers of the pipe. In practice, determination of fluid permeation was simple and the skilled person knew how to measure it. For a specific material a coefficient of permeability could be determined at a selected temperature and the permeability of a layer of

less than 1 mm could be determined by measuring the permeability of a thicker layer, as permeability was simply proportional to the thickness of the layer. Moreover, the specification provided enough information about how a sufficiently strong bonding could be achieved.

– The subject-matter of claim 1 was novel over the disclosure of D5 because in this document the bonding between the layers was only a partial bonding while the polymer layer and the film layer in claim 1 were bonded to each other along their whole interface. This feature was already implicit in the subject-matter of claim 1 as granted and it had been now made explicit by the further requirement of claim 1 that the interfacial bonding prevents the creation of gas pockets.

XII. The arguments presented by the respondent may be summarised as follows:

– Document D19 should not be admitted into the proceedings due to its lack of relevance, the reason being that it did not disclose a method of measuring the permeation barrier.

– The subject-matter of claim 1 extended beyond the content of the application as filed. The claimed combination of features was not clearly and unambiguously derivable from the content of the application as filed. This objection was supported by several decisions of the boards of appeal, in

particular decisions T 1511/07, T 0812/09 and T 0978/99.

– The requirements of sufficiency of disclosure were not fulfilled because:
  (i) No method of measuring the "fluid permeation barrier" was specified in the patent;
  (ii) The skilled person would not know how to implement the feature "said polymer layer being bonded to the film layer";
  (iii) The invention could not be performed over the whole area claimed; and
  (iv) The specification was silent about how to determine whether gas pockets are formed or not.

– The subject-matter of claim 1 lacked novelty having regard to the disclosures of D5 and D6, which disclosed, at least implicitly, all the features of claim 1.

XIII. The appellant requested that:

(1) The decision under appeal be set aside and the patent be maintained on the basis of the sixth alternatively the seventh auxiliary request filed with the statement of grounds of appeal;
(2) The case be remitted to the opposition division for consideration of inventive step.

XIV. The respondent requested that:

(1) The appeal be dismissed;
(2) Document D19 be not admitted into the proceedings;

(3) (In the event of these requests not being granted) the case be remitted to the opposition division for consideration of inventive step.

Reasons for the Decision

1. The appeal is admissible.

2. *Admissibility of documents D15 to D20*

2.1 Document D15 was filed by the respondent outside the nine-month opposition time limit and was not admitted into the proceedings by the opposition division *inter alia* because it did not bear a publication date.

During the appeal proceedings the respondent filed a further copy of D15, *i.e.* D15a, to show that the content of document D15 had been published in 2001.

During the oral proceedings before the board the appellant in fact also requested that D15a be admitted into the proceedings.

Under these circumstances, D15a was admitted into the proceedings.

2.2 Document D19 was filed by the patent proprietor during the oral proceedings before the opposition division and admitted into the proceedings by the opposition division due to its relevance.

The respondent requested its non-admittance because in its opinion D19 does not contain any information of

relevant interest for the proceedings, in particular because it does not disclose a standard method of measuring the permeation barrier.

The admissibility of a document filed during the oral proceedings before the opposition division is within the discretionary power of the opposition division. The respondent has not provided in the appeal proceedings any reason as to why the opposition division had not correctly exercised its discretionary power. There is therefore no reason why the board should overrule the opposition division's discretionary decision to admit document D19 into the proceedings.

2.3 Concerning documents D16, D17 and D18, which had not been admitted by the opposition division into the proceedings, none of the parties relied on these documents during the oral proceedings before the board. There is thus no need for the board to further elaborate on the admissibility of these documents. The same applies for the newly filed documents D17a and D20.

SIXTH AUXILIARY REQUEST

3. *Preliminary remark*

3.1 Present auxiliary request 6 is identical to auxiliary request 6 before the opposition division (point IV above). The opposition division rejected this request because:

– It comprised subject-matter that extended beyond the content of the application as originally filed, contrary to the requirements of Article 123(2) EPC;

- The patent was not disclosed in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art, contrary to the requirements of Article 83 EPC; and
- The subject-matter of claim 1 was not clear, contrary to the requirements of Article 84 EPC.

3.2 Concerning Article 84 EPC the opposition division's objection was directed to the feature "with interfacial bonding between the polymer layer and the film layer which is sufficiently strong to prevent creation of gas pockets between the layers when subjected to an increased carbon dioxides pressure on the film side of the pipe, the increased carbon dioxides pressure being 1 bar". The opposition division concluded that this feature as added to the claim was unclear, because the claim did not specify for how long or at which temperature the increased carbon dioxide pressure should be maintained before testing whether gas pockets had been created.

3.3 The board notes, however, that claim 1 of the sixth auxiliary request results from the incorporation of a feature from granted claim 15 into granted claim 1.

3.4 When amendments are made to a patent during opposition, Article 101(3) EPC requires consideration to be given as to whether the amendments introduce any contravention of any requirement of the Convention, including Article 84 EPC. However Article 101(3) EPC does not allow objections to be based upon Article 84 EPC, if such objections do not arise out of the

amendments made (see, for example, T 301/87, OJ 1990, 335, point 3.8 of the Reasons).

3.5 The clarity objection raised by the opposition division was already present in granted claim 15 and consequently this objection has no connection with the amendments made. It cannot be objected to under Article 84 EPC in these proceedings.

4. *Amendments*

4.1 The subject-matter of claim 1 is directed to a flexible unbonded pipe having the following features:

1 - a flexible unbonded pipe which comprises:

2(a) - at least one polymer layer

2(b) - having a thickness of 4 mm or more, and

3(a) - one film layer

3(b) - having a thickness of 1 mm or less,

4 - said polymer layer is at least 10 times as thick as the film,

5 - said film layer provides a fluid permeation barrier against one or more of the fluids methane, hydrogen sulphides, carbon dioxide and water, higher than the fluid permeation barrier provided by the polymer layer determined at 50°C and a pressure difference of 50 bars, and

6(a) - said polymer layer is bonded to said film layer

6(b) - with interfacial bonding between the polymer layer and the film layer sufficiently strong to prevent creation of gas pockets between the layers when subjected to an increased carbon dioxide pressure on the film side of the pipe of 1 bar.

4.2 This claim is based on claim 1 as originally filed as regards features 1, 2(a), 3(a) and 6(a), to which features 2(b), 3(b), 4, 5 and 6(b) have been added.

It is undisputed that the added features are disclosed in the application as originally filed (cf. claims 19 to 22 for features 2(b), 3(b), 4 and 5 and claim 15 for feature 6(b)). In this context it is noted that dependent claims 15 and 19 to 22 in the application as filed all refer back to the flexible pipe "according to any one of the preceding claims".

It is further undisputed that the specific combination of features of present claim 1 is not explicitly disclosed in the application as filed.

4.3 It is therefore to be decided whether this specific combination of features infringes the requirements of Article 123(2) EPC, that is to say, whether this amendment results in the skilled person being presented with technical information which he would not derive directly and unambiguously, using common general knowledge, from the application as filed (see, for instance, G 2/10 OJ EPO 2012, 376, point 4.3 of the reasons for the decision).

4.4 The features added to claim 1 from the dependent claims are disclosed in the application as filed together with further preferred values for the same feature. Thus, for instance, the thickness of the polymer layer (feature 2(b)), is disclosed in claim 19 as filed as being "at least 4 mm, such as at least 6 mm, such as at least 8 mm, such as at least 10 mm, such as at least 12 mm, preferably the polymer layer has a thickness

between 4 and 20 mm, such as between 8 and 15 mm". Similar considerations apply for all other features incorporated into claim 1, which were all disclosed together with several alternatives.

4.5 The subject-matter of claim 1 results from the incorporation of the broadest possible definition of:

- the thickness of the polymer layer (claim 19 as filed),
- the thickness of the film layer as regards the explicitly mentioned upper limit (claim 21 as filed),
- the permeation barrier (claim 22 as filed) and
- the strength of the interfacial bonding (claim 15 as filed),

together with one of the values specifically disclosed for the ratio of polymer layer to film layer (*i.e.* one alternative out of four, claim 20 including the values 4 times, 10 times, 50 times and up to 100 times). By doing so, no new combinations arise since the now-claimed combination was foreseen by means of dependent claims in the application as originally filed. Accordingly, the amendments do not contravene the requirements of Article 123(2) EPC.

This finding that the amendment made does not result in the skilled person being presented with technical information which he would not derive directly and unambiguously from the application as filed is further confirmed by all the working examples which fall within the scope of claim 1 as amended. Normally, working examples provide preferred embodiments of an invention. Thus, the working examples in the present case provide

an additional pointer towards the combination of features required in claim 1.

4.6 The opposition division did not allow the amendment because in its opinion features 2(b), 3(b) and 4 were not disclosed in combination. The opposition division considered that the selection of the first preferred option for the thickness ratio with more general ranges for the thickness of the two layers resulted in a combination which was not derivable from the application as filed. The opposition division also considered that when choosing a 4 mm thick polymer layer being 10 times thicker than the film layer, the resulting film layer should have a thickness of 0.4 mm, a value not mentioned in the application as filed. The opposition division relied on decision T 1511/07 of 31 July 2009 (not published in the OJ EPO) in support of its arguments.

4.7 The respondent agreed with the finding of the opposition division that the claimed combination of features was not derivable from the application as filed because the combination was the result of an arbitrary selection similar to the singling out of a chemical compound from several lists of alternatives. In fact the subject-matter now claimed was an arbitrary selection of values having a different preferential ranking from those in the application as filed. The respondent cited in its written submissions several decisions of the boards of appeal in support of its arguments; during the oral proceedings it relied on T 0812/09 of 8 July 2011 and T 0978/99 of 19 January 2004 (both not published in OJ EPO). The respondent further argued that the selected upper limit for the

thickness of the film layer (1 mm or less) was disclosed in the application as filed only in association with a lower limit (25 µm or more).

4.8 The board disagrees with the opposition division and the respondent for the following reasons:

– A film thickness of 0.4 mm is not explicitly mentioned in claim 1 but is merely a consequence of a specific selection within the scope of claim 1. However, an implicit teaching of a film thickness of 0.4 mm was already provided by the application as filed. As set out in point 4.5 above, the skilled person would directly and unambiguously derive from the application as filed that the combination of features stated in claims 1, 19, 20 and 21 encompasses the preferred ranges of the thickness of the polymer layer and the preferred thickness ratio of 10 thereby creating an implicit disclosure for a film thickness of 0.4 mm.

– In T 1511/07 the combination of an individual, narrow sub-range obtained by selecting explicitly disclosed borderline values defining several (sub-) ranges, with another individual range emerging from a second list of ranges and relating to a different feature was not considered to be disclosed in the application as filed in the absence of a clear pointer to such a combination (see point 2.1 of the reasons). That case differs from the present one in that amended claim 1 does not comprise any new, narrow sub-range resulting from a selection of explicitly disclosed

borderline values. All features in claim 1 are open-ended, the specific values being all explicitly disclosed in the claims of the application as filed as discussed above.

– In T 0812/09 an amended claim including a selection of four different groups of features having different preferential rankings in the original application was not allowed because an explicit combination of these features could not be found anywhere in the original application documents, which also did not state or suggest that all the not-preferred, less-preferred and most-preferred features could be combined arbitrarily (see point 3.1 of the reasons). The situation in that case is again different from the present one. In that case features had been taken from the description in isolation and without a reference to the other features of the amended claim. On the contrary, in the present case the features incorporated into claim 1 all arise from dependent claims referring back to the flexible pipes of "any of the preceding claims". In the circumstances of the present case, the expression has to be read meaningfully by the skilled person, and in principle it allows the combination now claimed.

– In T 0978/99 an amendment resulting in an unallowable individualisation of the original content of the application was found not to be supported by the application as filed (point 2.1 of the decision). Such a situation does not arise in claim 1 of the patent in suit. The subject-

matter of the claim is undoubtedly restricted compared to claim 1 of the application as filed but it does not amount to an individualisation or "singling out" of an embodiment not specified in the application as filed.

– Finally, the upper limit for the thickness of the film layer is not disclosed in association with a lower limit. The definitions in claim 21 of the application as filed do not disclose any range for the thickness, the values being given as alternatives either for the lower limit or the upper limit ("... the film layer has a thickness of about 25 µm or more, such as about 100 µm or more ... such as 1 mm or less."). This is confirmed by the description of the application as filed where it is clear that both features have a different function, namely, the "maximum" feature (1 mm or less) has the function of obtaining high flexibility (page 4, line 6) and the "minimum" value has the function of obtaining high barrier properties (page 4, lines 7-8). The description as filed also refers on page 5, lines 29-31 and on page 10, lines 11-13 to the thickness of the film layer only by reference to its upper limit. Consequently, the skilled person would recognise from the application as filed that the two values are not dependent on each other.

4.9 For these reasons the subject-matter of claim 1 does not extend beyond the content of the application as filed (Articles 100(c) and 123(2) EPC). The same applies to the subject-matter of claim 38, which is directed to a method of producing the flexible pipe of

claims 1 to 37 and which has been amended in the same way as claim 1.

4.10 Claim 1 results from the combination of granted claims 1 and 15. This amendment undisputedly restricts the scope of the claims. Therefore the subject-matter of the amended claims also fulfils the requirements of Article 123(3) EPC.

5. *Sufficiency of disclosure*

5.1 According to the opposition division the requirements of sufficiency of disclosure were not fulfilled because:

- (i) The method of measuring the "fluid permeation barrier" was not specified in the patent; and

- (ii) The skilled person would not know how to implement the feature "said polymer layer being bonded to the film layer".

The respondent additionally argued that the requirements of sufficiency were not fulfilled because:

- (iii) The invention could not be performed over the whole area claimed; and

- (iv) The skilled person would not know how to put into effect feature 6(b) of claim 1. This feature related to a parameter which was not properly defined in the specification.

5.2 The board finds these objections unjustified for the following reasons:

5.2.1 The patent relates to a flexible unbonded pipe comprising two layers and to a process for its preparation. The board notes that the specification includes detailed information concerning the polymer layer ([paragraphs [0020]-[0026]), the film layer ([0027] - [0034]), the nature of the bonding between the layers ([0035]-[0049]), the thickness of the layers and the structure of the flexible pipe ([0050]-[0076]). It also describes methods for producing the pipes ([0077]-[0082]) and three working examples.

5.2.2 As regards point (i) above, there is no information in the specification as to how to measure the fluid permeation barrier of the film layer and the polymer layer. The question to be answered in this context is whether the skilled person using his common general knowledge would know how to determine this property.

As indicated by the appellant, fluid permeability is one of the standard design parameters for flexible pipes (see D19, section 6.2.3.1 and Table 11 on page 21). This alone suggests that the skilled person in the field knows very well how to measure the permeability of the relevant layers of flexible pipes.

Furthermore, it cannot be disputed that methods for determining the permeability of a material are well known to the skilled person. As explained by the appellant, a permeation test is relatively simple and there are several apparatuses to measure the gas flow through a film. A common point for all these apparatuses is the measurement cell: the layer to be measured is placed inside the cell and the cell is

divided into two tight compartments to force the gas to pass through the layer. On one side the test gas is introduced and held at the desired pressure and temperature (50 bars and 50°C according to claim 1). On the other side the permeate is withdrawn and the amount is determined. The permeability of the film layer and the polymer layer of claim 1 can thus be determined by the skilled person in a simple manner.

Document D15a, relied upon by the respondent, in fact discloses a device for such a measurement of gas permeability (see Figure 5) and no problems were mentioned in this document as regards the measuring of the gas permeation for several gases, including the ones required by claim 1 of the patent (see "Permeability Results and Discussion" on pages 90-96). The objections raised by the respondent based on D15a, indicating that the skilled person would not know how to measure the fluid permeation barrier cannot be accepted by the board in view of the above mentioned measurements of gas permeability in this document.

The opposition division and the respondent argued that the absence of a specific method of measurement in the specification constituted an undue burden for the skilled person, as the different methods would give different results. Apart from the fact that there is no evidence on file that different methods would indeed give different results, it is noted that claim 1 does not require any specific permeability value. It merely requires that the film layer provides a higher permeation barrier than the polymer layer. It is self-evident for a skilled person that this requirement implies that the permeability must be measured for both

layers with the same apparatus and under the same conditions. There is no evidence on file that such a simple and straightforward approach would fail, let alone amount to an undue burden.

Concerning the further objection that the thickness of the film layer might be too low to be measured, the board agrees with the appellant that the permeability can be measured on a thicker layer and then calculated for the thinner layer, because the permeability is proportional to the thickness of the layer. Alternatively, the permeability of the two layers already bonded can be measured and then the value for the film layer be calculated by subtracting from the measured value the known value for the polymer layer.

5.2.3 Concerning point (ii), the specification provides guidance as to how to bond the two layers together, in particular as to how to provide a sufficiently strong bonding to avoid formation of gas pockets. Thus in paragraph [0041] it is stated that "the individual layers may e.g. be glued or pressed together, or the bonding may be obtained by subjecting the polymeric layer to heat to softening or even melting point. As another alternative the individual layers may be sprayed or brushed e.g. in the form of a solution or dispersion in a solvent, which solvent afterwards is allowed to evaporate." Thus the specification provides enough information about how to provide the required bonding between the polymer layer and the film layer.

5.2.4 According to the respondent the invention could not be performed over the whole area claimed (point (iii) above), because certain combinations of parameters

within the scope of claim 1 would not provide flexible pipes. Thus, choosing a relatively thick metal film layer would, according to the calculations of the respondent, result in non-flexible structures.

However, the appellant disputed that such pipelines could not be used as flexible pipes. The board agrees in this respect with the appellant that even less optimal embodiments within the scope of claim 1 may still have some value for certain applications.

But even if there were a combination of parameters within the scope of claim 1 that yielded a non-flexible pipe, such an occasional lack of success does not in itself justify an objection under sufficiency of disclosure. There appear to be enough possibilities at hand for the skilled person to overcome this lack of success, e.g. by using a thinner metal film or by using a different, more flexible film material.

5.2.5 Finally, as regards the objection under point (iv) above, this objection essentially focussed on the point at which the prevention of the formation of gas pockets had to be measured. The board agrees with the appellant that the skilled person would of course carry out this measurement under steady-state flow conditions, similar to the conditions indicated in D19, section 6.2.3.1, for the measurement of the fluid permeability. In the board's view this is the only technically meaningful assessment of this measurement.

5.2.6 For these reasons, and in the absence of any contrary experimental evidence, the board finds that the requirements of sufficiency of disclosure are fulfilled.

6. *Novelty (Article 54 EPC)*

6.1 The respondent raised novelty objections in view of the disclosure of documents D5 and D6.

6.2 Document D5

6.2.1 Document D5 discloses on page 9, line 3 to page 10, line 15 (see also figure 5) a flexible unbonded pipe (feature 1) of claim 1) comprising a polymer layer (1) made of Rislan® 11 having a thickness of 4 mm (features 2(a) and 2(b)) and a film layer (3) made of an amorphous-metal alloy, $Fe_{72}Cr_8P_{13}C_7$, having a thickness of 0.2 mm (features 3(a) and 3(b)). The polymer layer is thus twenty times thicker than the film layer (feature 4). There is no explicit disclosure of feature 5, namely that the film layer provides a higher fluid barrier than the polymer layer, but the board agrees with the opposition division and the respondent that this feature is implicitly disclosed in D5. The metal alloy used in D5 would necessarily present a higher barrier to permeation than the polyamide layer. Thus D5 discloses features 1 to 5 of claim 1.

The nature of the bond between the polymer layer and the film layer is described on page 9, lines 3-22. The layers are bonded using a hot-melting glue (5) compatible with Rilsan® 11 in such a way that the overlap zones represents about 20% (page 9, lines 19-22). Thus, the polymer layer (1) and the film layer (3) in D5 are partially bonded by the edge (5) of the hot melting glue band (see figure 5).

6.2.2 It was the argument of the appellant during the opposition and appeal proceedings that the term "bonded" as used in claim 1 as granted was used in the patent in suit to mean a face-to-face bonding, that is to say, a full interface bonding and that therefore the subject-matter of claim 1 as granted was novel over D5, which disclosed only a partial bonding.

6.2.3 The opposition division denied novelty for the subject-matter of granted claim 1 because in its opinion the term "bonded" as used in the opposed patent was considered to include a partial bonding such as the one of document D5. During the course of oral proceedings before the board, the board indicated that it agreed with this interpretation and confirmed the opposition division's ruling on novelty of granted claim 1, the reason being that the term "bonded" had to be interpreted broadly. There was no reason to accept the appellant's more restricted interpretation of the term.

6.2.4 In claim 1 of auxiliary request 6, however, the nature of the bonding between the polymer layer and the film layer has been further defined to indicate that the layers are bonded "with interfacial bonding between the polymer layer and the film layer which is sufficiently strong to prevent creation of gas pockets between the layers when subjected to an increased carbon dioxide pressure on the film side of the pipe, the increased carbon dioxide pressure being 1 bar" (claim 1, feature 6(b)).

6.2.5 The subject-matter of claim 1 has thus been limited to ensure that the bond between the layers is an interfacial bonding wherein no gas pockets can be

formed. This feature distinguishes the subject-matter of claim 1 of the disclosure of D5, which undisputedly discloses a partial bond. As convincingly explained by the appellant, such a partial bond cannot prevent the creation of gas pockets, namely where the two layers are not bonded.

6.2.6 For these reasons the subject-matter of claim 1 is novel over D5.

6.3 Document D6

6.3.1 D6 discloses a flexible unbonded pipe comprising a polymer layer having a thickness of 0.5 to 10 mm bonded to a film layer having a thickness of 2 microns to 2 mm (see page 5, line 7 to page 7, line 9). In the specific embodiment disclosed on page 12, line 4 to page 13, line 2, the thickness of the film layer is 12 microns (page 12, line 13) and the thickness of the polymer layer is not specified.

6.3.2 Although there is no specific embodiment presenting all the features of the claim, the respondent maintained that D6 was novelty destroying because, according to EPO practice, it is possible to combine different passages of one document when examining novelty, provided that there are no reasons which would prevent the skilled person from making such a combination. In the present case there was no reason why the skilled person would not combine the value of 12 microns used in the working example for the film layer with the range given for the polymer layer on page 5. The skilled person would thus arrive at an embodiment covered by claim 1.

6.3.3 However, the board cannot accept the respondent's argument.

In fact, in order to arrive at an embodiment falling within the subject-matter of claim 1, a multiple selection within the teaching of D6 has to be made. In particular, it is necessary to make at least the following selections:

- firstly, select a polymer layer having a thickness of 4 mm or more (from the range 0.5 to 10 mm disclosed in D6),
- select a film layer having a thickness of 1 mm or less (from the range 2 microns to 2 mm), and
- finally select a thickness ratio of polymer layer to film layer of 10 or more (no specific ratio being disclosed in D6).

According to EPO practice, in case of a "multiple selection", one would have to show that the "combined selection" emerges from the prior art. In the present case, however, a person skilled in the art would have had no reason when applying the teaching of D6 to concentrate on the combination of features set out in claim 1. Such a combined selection is neither explicitly disclosed in, nor clearly and unambiguously derivable from, D6.

There is no information at all in D6 indicating that the polymer layer should be at least 10 times thicker than the film layer. On the contrary, the ranges specified in D6 even contemplate that the film layer may be thicker than the polymer layer. This is the case when the polymer layer is 2 mm or thinner. Also there

is no information in the working embodiments about this parameter, as the only value given is the thickness of the film layer. Thus, the respondent's combination of a value from the examples with text passages from the document is based on hindsight, and is certainly not clearly and unambiguously derivable from D6.

6.4 For these reasons the board concludes that the subject-matter of claim 1 is also not anticipated by the disclosure of D6.

6.4.1 In summary, the subject-matter of claim 1 of auxiliary request 6 is novel over the cited prior art. The same applies to dependent claims 2 to 37 and to claims 38 to 45, which relate to a method of preparing the flexible unbonded pipe of claim 1.

7. *Remittal (Article 111(1) EPC)*

7.1 The board has decided that the subject-matter of the claims of auxiliary request 6 overcomes the objections under Articles 123(2), 83 and 54 EPC forming the basis of the decision under appeal.

7.2 The opposition division has not yet taken a decision on the other patentability issues raised by the respondent, namely inventive step.

7.3 Furthermore both the appellant and the respondent requested remittal of the case to the opposition division for further prosecution.

7.4 Under these circumstances, the board considers it appropriate to exercise its discretion under

Article 111(1) EPC to remit the case to the opposition division for further prosecution on the basis of auxiliary request 6.

SEVENTH AUXILIARY REQUEST

8. In view of the fact that the board has decided to remit the case to the opposition division for further prosecution on the basis of auxiliary request 6, there is no need to decide on the seventh 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 for further prosecution on the basis of claims 1 to 45 according to sixth auxiliary request filed with the statement of grounds of appeal.

The Registrar: The Chairman:

M. Cañueto Carbajo W. Sieber