

PATENT COOPERATION TREATY

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

PCT

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(PCT Rule 71.1)

To:

Mathys & Squire LLP
The Shard
32 London Bridge Street
London SE1 9SG
ROYAUME UNI

RECEIVED
MATHYS & SQUIRE LLP

19 JUN 2025

REPLY DATE

DIARY ENTERED

Date of mailing
(day/month/year)

13.06.2025

Applicant's or agent's file reference
I34586

IMPORTANT NOTIFICATION

International application No.
PCT/US2024/018918

International filing date (day/month/year)
07.03.2024

Priority date (day/month/year)
07.03.2023

Applicant
Prestone Products Corporation

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary report on patentability and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

4. REMINDER

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary report on patentability. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

The applicant's attention is drawn to Article 33(5), which provides that the criteria of novelty, inventive step and industrial applicability described in Article 33(2) to (4) merely serve the purposes of international preliminary examination and that "any Contracting State may apply additional or different criteria for the purposes of deciding whether, in that State, the claimed inventions is patentable or not" (see also Article 27(5)). Such additional criteria may relate, for example, to exemptions from patentability, requirements for enabling disclosure, clarity and support for the claims.

Name and mailing address of the international
preliminary examining authority:



European Patent Office
D-80298 Munich
Tel. +49 89 2399 - 0

Authorized Officer

Kurzbauer, Katja

Tel. +49 89 2399-6020



PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference I34586	FOR FURTHER ACTION		See Form PCT/IPEA/416
International application No. PCT/US2024/018918	International filing date (day/month/year) 07.03.2024	Priority date (day/month/year) 07.03.2023	
International Patent Classification (IPC) or national classification and IPC INV. C09K5/10			
Applicant Prestone Products Corporation			
1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36. 2. This REPORT consists of a total of <u>6</u> sheets, including this cover sheet. 3. This report is also accompanied by ANNEXES, comprising: a. ☒ a total of <u>8</u> sheets, as follows: ☒ sheets of the description, claims and/or drawings which have been amended and/or sheets containing rectifications authorized by this Authority, unless those sheets were superseded or cancelled, and any accompanying letters (see Rules 46.5, 66.8, 70.16, 91.2, and Section 607 of the Administrative Instructions). ☐ sheets containing rectifications, where the decision was made by this Authority not to take them into account because they were not authorized by or notified to this Authority at the time when this Authority began to draw up this report, and any accompanying letters (Rules 66.4bis, 70.2(e), 70.16 and 91.2). ☐ superseded sheets and any accompanying letters, where this Authority either considers that the superseding sheets contain an amendment that goes beyond the disclosure in the international application as filed, or the superseding sheets were not accompanied by a letter indicating the basis for the amendments in the application as filed, as indicated in item 4 of Box No. I and the Supplemental Box (see Rule 70.16(b)). b. ☐ a separate electronic file containing a sequence listing (sent to the International Bureau only)			
4. This report contains indications relating to the following items: ☒ Box No. I Basis of the report ☐ Box No. II Priority ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability ☐ Box No. IV Lack of unity of invention ☒ Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement ☐ Box No. VI Certain documents cited ☐ Box No. VII Certain defects in the international application ☐ Box No. VIII Certain observations on the international application			
Date of submission of the demand 04.11.2024		Date of completion of this report 13.06.2025	
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0		Authorized officer Puetz, Christine Telephone No. +31 70 340-3759	



**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**

International application No.
PCT/US2024/018918

Box No. I Basis of the report

1. With regard to the **language**, this report is based on
- ☒ the international application in the language in which it was filed
 - ☐ a translation of the international application into , which is the language of a translation furnished for the purposes of:
 - ☐ international search (under Rules 12.3(a) and 23.1(b))
 - ☐ publication of the international application (under Rule 12.4(a))
 - ☐ international preliminary examination (under Rules 55.2(a) and/or 55.3(a) and (b))
2. With regard to the **elements*** of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):

Description, Pages

1-81 as originally filed

Claims, Numbers

1-30 filed in electronic form on

17-01-2025

Drawings, Sheets

1/9-9/9 as originally filed

- ☐ a sequence listing - see Supplemental Box Relating to Sequence Listing.
3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages
 - ☐ the claims, Nos.
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since either they are considered to go beyond the disclosure as filed, or they were not accompanied by a letter indicating the basis for the amendments in the application as filed, as indicated in the Supplemental Box (Rules 70.2(c) and (c-bis)):
- ☐ the description, pages
 - ☐ the claims, Nos.
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
5. ☐ This report has been established:
- ☐ taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rules 66.1(d-bis) and 70.2(e)).
 - ☐ without taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91(Rules 66.4bis and 70.2(e)).

**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**

International application No.
PCT/US2024/018918

6. ☒ With regard to top-up searches (Rules 66.1 *ter* and 70.2(f)):
- ☒ A top-up search was carried out by this Authority on 11.11.2024 (all discovered documents are listed in the Supplemental Box Relating to Top-up Search).
 - ☐ Additional relevant documents have been discovered during the top-up search.
 - ☐ No top-up search was carried out by this Authority because it would serve no useful purpose.
7. ☐ Supplementary international search report(s) from Authority(ies) has/have been received and taken into account in establishing this report (Rule 45bis.8(b) and (c)).

* If item 4 applies, some or all of those sheets may be marked "superseded".

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	<u>6-8, 13-23, 25, 26, 28</u>
	No: Claims	<u>1-5, 9-12, 24, 27, 29, 30</u>
Inventive step (IS)	Yes: Claims	
	No: Claims	<u>1-30</u>
Industrial applicability (IA)	Yes: Claims	<u>1-30</u>
	No: Claims	

2. Citations and explanations (Rule 70.7):

see separate sheet

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1 Reference is made to the following documents:

- D1** US 2012/270129 A1 (MARINHO FILIPE J [US] ET AL) 25 October 2012 (2012-10-25)
- D2** WO 2022/043303 A1 (BASF SE [DE]) 3 March 2022 (2022-03-03)
- D3** EP 4 117 085 A1 (BASF SE [DE]) 11 January 2023 (2023-01-11)
- D4** US 2019/225855 A1 (YANG BO [US] ET AL) 25 July 2019 (2019-07-25)
- D5** CN 104 087 255 A (LIANG SHENGGUANG) 8 October 2014 (2014-10-08)

2 **Amended claim set:**

With letter of 17-01-2025 the applicant has filed an amended claim set of claims 1-30. Th applicant is informed that this claims set is regarded to be allowable.

3 **Novelty:**

3.1 The present application does not meet the criteria of Article 33(2) PCT, because the subject-matter of claims 1-5,9-12,24,27,29 and 30 is not new.

D3 discloses (claims) coolants and the use of said coolants. In claims 1 and 15 the following is indicated:

1. Coolant, comprising

(A) at least one 1,2-propylene glycol or derivatives thereof

(B) water

(C) at least one azole derivative

(D) optionally at least one ester of orthosilicic acid or alkoxy alkylsilane

(G) optionally at least one silicophosphonate

(H) optionally at least one further coolant additive

wherein at least one of the components (D) and (G) is present, and

wherein the electrical conductivity is at most 50 $\mu\text{S}/\text{cm}$, preferably at most 40 $\mu\text{S}/\text{cm}$, more preferably at most 30 and most preferably at most 20 $\mu\text{S}/\text{cm}$.

15. Use of a coolant according to any of the Claims 1 to 14 as coolants in cooling systems of vehicles with electric engines, fuel cells or hybrid engines with a combination of combustion engines with electric engines or a combination of combustion engines with fuel cells.

In claim 5 details about the azole derivative are provided.

In examples 3 to 5 formulations according to Table 2a were submitted to a corrosion test of an aluminium specimen according to ASTM D4340 for 168 hours. pH-value was determined before and after the test and the and electrical conductivity (ASTM D 1125) was measured. The results are given in Table 2b.

Table 2a

Raw material	Ex 3	Ex 4	Ex 5
1,2-Propylene glycol	50.0	50.0	50.0
Pure water (distilled)	49.8	49.8	49.7
Surfactant	0.1	0.1	0.1
Tetraethoxysilane	0.1	...	0.1
Silicophosphonate*	...	0.1	0.1
Total	100	100	100

* Silicophosphonate (Formula (V), R⁵ = 1,3-propylene, R⁶, R⁷ = methyl and ethyl (statistical mixture), sodium salt)

Table 2b

	Ex 3	Ex 4	Ex 5
Corrosion (mg/cm ²)	-0.01	-0.01	-0.01
Electrical conductivity before test [$\mu\text{S}/\text{cm}$]	0.8	37.3	38.6
pH-value before test	9.35	7.74	7.75
pH-value after test	8.49	7.24	7.53

With regard to **D3** the applicant has provided the following arguments:

"Regarding D3, the Written Opinion notes that its heat transfer compounds require at least one ester of orthosilicic acid or alkoxy alkylsilane and the Written Opinion points to examples 3-5 in Table 2a where tetraethoxysilane is exemplified. Such compounds, which are necessary to D3's heat transfer compounds, are excluded by amended claims 1 and 27 enclosed herewith. As such, D3 cannot and does not destroy the novelty of the current claims."

This cannot be accepted for the following reasons:

Contrary to the applicant's arguments, at least one ester of orthosilicic acid or alkoxy alkylsilane is not required, but an optional component (see claim 1 of **D3**). Furthermore with regard to examples 3-5 it is noted that in example 4 tetraethoxysilane is not exemplified.

The subject-matter of present claims 1-5,9-12,24,27,29 and 30 is not novel.

- 3.2 In view of the amended claim set novelty objections raised in the written opinion with regard to documents **D1**, **D2** and **D4** are no longer maintained.

4 Inventive step:

The present application does not meet the criteria of Article 33(3) PCT, because the subject-matter of claims 1-30 does not involve an inventive step.

4.1 Claims 1-5,9-12,24,27,29,30:

The subject-matter of these claims is not novel. Therefore it does also not involve an inventive step.

With regard to claim 1, **D4** could be used as closest prior art for an inventive step objection, with the conductivity of the heat transfer fluid of less than 500 $\mu\text{m/S}$ as only distinguishing feature. The skilled person will arrive at the claimed subject-matter in an obvious way.

4.2 Claims 6-8,13-23,25,26,28:

Dependent claims 6-8,13-23,25,26,28 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of inventive step.

The additional features are well-known to the skilled person in the art. Reference to neutral phosphates as corrosion inhibitors, alkaline earth ions is e.g. made in **D4**.

Claims:

1. A heat transfer or thermal management system fluid comprising:
a freezing point depressant;
water having an electrical conductivity less than 5 $\mu\text{S}/\text{cm}$; and
a corrosion inhibitor composition that includes one or more electrically non-conductive, low electrical conductivity corrosion inhibitors, or a combination of one or more organic acid and one or more organic base;
wherein a conductivity of the heat transfer or thermal management system fluid is less than or equal to about 500 $\mu\text{S}/\text{cm}$ and wherein the heat transfer fluid is free of siloxane-polyether copolymers and organosilane-based compounds.
2. The heat transfer or thermal management system fluid of claim 1 wherein the conductivity of the heat transfer fluid is less than or equal to about 25 $\mu\text{S}/\text{cm}$ or less than or equal to about 10 $\mu\text{S}/\text{cm}$.
3. The heat transfer or thermal management system fluid of claim 1 or 2 wherein the freezing point depressant comprises glycerol, an alcohol, ethylene glycol, 1,2-propylene glycol, 1,3-propanediol, or a combination thereof.
4. The heat transfer or thermal management system fluid of any one of claims 1 to 3 wherein the freezing point depressant is present in an amount of about 10 wt.% to about 99.85 wt.% or about 30 wt.% to about 99.5 wt.%, or about 40 wt.% to about 99 wt.%, based on a total weight of the heat transfer fluid.
5. The heat transfer or thermal management system fluid of any one of claims 1 to 4 wherein the water is present in an amount from about 0.05 wt.% to about 80 wt.%, based on a total weight of the heat transfer fluid.
6. The heat transfer or thermal management system fluid of any one of claims 1 to 5 wherein the corrosion inhibitor comprises one or more neutral phosphate esters.
7. The heat transfer or thermal management system fluid of claim 6 wherein the one or more neutral phosphate esters is selected from tris(2-butoxyethyl) phosphate,

PCT/US2024/018918

Attorney Docket: 69810-406955

trialkoxymethyl phosphates, alkyl phosphonocarboxylates, alkoxy phosphonocarboxylates, and mixtures thereof.

8. The heat transfer or thermal management system fluid of claim 7 wherein the alkyl phosphonocarboxylates and alkoxy phosphonocarboxylates are selected from triethyl phosphonoformate, triethyl phosphonoacetate, trimethyl phosphonoacetate, methyl diethylphosphonacetate, triethyl 2-phosphonopropionate, triethyl-3-phosphonopropionate, trimethyl-3-phosphonopropionate, and mixtures thereof.

9. The heat transfer or thermal management system fluid of any one of claims 1 to 5 wherein the combination of the one or more organic acid and the one or more organic base exhibits a substantially neutral pH combination and the one or more organic acid comprises a carboxylic acid, an organophosphate, phosphonate, phosphinate, and wherein the one or more organic base includes an amine compound, amino acids, azoles, and thiazoles.

10. The heat transfer or thermal management system fluid of claim 9 wherein the azole is selected from the group consisting of an optionally substituted benzotriazole, an optionally substituted tolyltriazole, an optionally substituted C₂ – C₂₀ alkyl benzotriazole, an optionally substituted mercaptobenzothiazole, an optionally substituted thiazole, an optionally substituted imidazole, an optionally substituted benzimidazole, an optionally substituted indazole, an optionally substituted tetrazole, tetrahydrobenzotriazole, tetrahydrotolyltriazole, and a combination thereof.

11. The heat transfer or thermal management system fluid of claim 10 wherein the optionally substituted C₂ – C₂₀ alkyl benzotriazole comprises a methyl benzotriazole, a butyl benzotriazole, or a combination thereof.

12. The heat transfer or thermal management system fluid of any one of claims 1 to 11 wherein the corrosion inhibitor is present in an amount of about 0.01% wt.% to about 10 wt.% based on a total weight of the heat transfer fluid.

13. The heat transfer or thermal management system fluid of any one of claims 1 to 12 further comprising one or more soluble alkaline earth metal ions.
14. The heat transfer or thermal management system fluid of claim 13 wherein the one or more soluble alkaline earth metal ions are selected from beryllium acetate, magnesium acetate, calcium acetate, strontium acetate, or mixtures thereof
15. The heat transfer or thermal management system fluid of claim 13 wherein the one or more soluble alkaline earth metal ions include (a) alkaline earth metal oxides or alkaline earth metal hydroxides in combination with (b) an acid.
16. The heat transfer or thermal management system fluid of claim 12, 13, 14, or 15 wherein the one or more soluble alkaline earth metal ions are present in an amount from about 0.001 wt.% to about 0.15 wt. %.
17. The heat transfer or thermal management system fluid of any one of claims 1 to 16 further comprising a non-ionic surfactant.
18. The heat transfer or thermal management system fluid of claim 17 wherein the non-ionic surfactant is present in an amount of about 0.01 wt.% to about 0.5 wt.% based on a total weight of the heat transfer fluid.
19. The heat transfer or thermal management system fluid of claim 17 wherein the non-ionic surfactant is selected from the group consisting of a sorbitan fatty acid ester, an alkoxyated alcohol, a polyalkylene glycol ester, a copolymer of ethylene oxide and propylene oxide, a polyoxyalkylene derivative of a sorbitan fatty acid ester, and a combination thereof.
20. The heat transfer or thermal management system fluid of claim 19 wherein the alkoxyated alcohol comprises an ethoxyated alcohol, a propoxyated alcohol, or a combination thereof.
21. The heat transfer or thermal management system fluid of claim 19 or 20 wherein the alkoxyated alcohol has:

PCT/US2024/018918

Attorney Docket: 69810-406955

(a) a formula:



wherein R is a C₄ – C₂₅, or a C₆ – C₁₅ linear primary alcohol, j is an integer from 0 to 15, k is an integer from 0 to 15, and j + k is an integer greater than or equal to 1; or

(b) a formula:



wherein R is a C₄ – C₂₅ or a C₆ – C₁₅ linear primary alcohol, and n is an integer from 1 to 15; or

(c) a formula:



wherein R is a C₄ – C₂₅ or a C₆ – C₁₅ linear primary alcohol, and m is an integer from 1 to 15.

22. The heat transfer or thermal management system fluid of any one of claims 20 or 21 wherein the alkoxyated alcohol is present in an amount of about 0.001 wt.% to about 1 wt.% based on a total weight of the heat transfer fluid.

23. The heat transfer or thermal management system fluid of any one of claims 1 to 22 wherein the low-conductivity corrosion inhibitor is selected from the group consisting of a colloidal silica, an amine salt of a cyclohexenic carboxylate, an amine compound, and a combination thereof.

24. The heat transfer or thermal management system fluid of any one of claims 1 to 23 further comprising an additive selected from the group consisting of a C₁ – C₂₀ tetraalkylorthosilicate ester, a colorant, a wetting agent, a biocide, a surfactant, an additional corrosion inhibitor, a non-ionic dispersant, and a combination thereof.

25. The heat transfer or thermal management system fluid of any one of claims 1 to 24 further comprising an antifoaming agent.

26. The heat transfer or thermal management system fluid of claim 25 wherein the antifoaming agent comprises a composition comprising an alcohol, a fatty alcohol alkoxylate and optionally an alkyl ethylene oxide-propylene oxide copolymer.

27. A method of preventing corrosion in a heat transfer system, the method comprising contacting at least a portion of the heat transfer system with a heat transfer fluid that comprises a freezing point depressant; water having an electrical conductivity less than 5 $\mu\text{S}/\text{cm}$; and a corrosion inhibitor composition that includes one or more electrically non-conductive, low electrical conductivity corrosion inhibitors, or a combination of one or more organic acid and one or more organic base; wherein a conductivity of the heat transfer fluid is less than or equal to about 500 $\mu\text{S}/\text{cm}$ and wherein the heat transfer fluid is free of siloxane-polyether copolymers and organosilane-based compounds.

28. The method of claim 27 wherein the heat transfer system comprises a component comprising carbon steel, aluminum, aluminum alloy, magnesium, magnesium alloy, yellow metal, or a combination thereof.

29. The method of claim 27 wherein the heat transfer system comprises a fuel cell.

30. The method of claim 27 wherein the heat transfer system comprises a thermal management system of an electric vehicle that includes a battery electric vehicle, a hybrid electric vehicle, a plug-in hybrid electric vehicle, a fuel cell electric vehicle, a range extender electric drive vehicle.

European Patent Office
Bob-van-Bentham-Platz 1
80469 Munich
Germany

Mathys & Squire LLP
The Shard, 32 London Bridge Street
London SE1 9SG
T: +44(0)20 7830 0000
F: +44(0)20 7830 0001
mail@mathys-squire.com
www.mathys-squire.com

Our Ref: 134586

Date: 17 January 2025

E-Filing

To Whom It May Concern

**Filing of Article 34 PCT Amendment & PCT Demand in respect of
PCT/US2024/018918 (WO 2024/187021)
Prestone Products Corporation**

We write in reply to the Written Opinion of the International Preliminary Examination Authority (WO-IPEA) dated 18 November 2024 and request further examination based on the following observations and replacement claims 1 to 30 enclosed herewith.

Amendments

Claims 1 and 27 of the claim set accompanying the Demand have been amended to remove the feature: *"wherein when the organic acid is a carboxylic acid it is present in an amount no more than 0.09%"*.

Amended claims 1 and 27 enclosed herewith therefore find basis in the original claims and in paragraphs [0077] and [0078] of the specification as filed.

Having regard to the above explanation, it is considered apparent that the amendments satisfy the requirements of the PCT.

Item 2

The above amendments are considered to address the Examiner's concerns with the amendments accompanying the Demand as set out in Item 2 of the WO-IPEA. The amended claims enclosed herewith find direct and unambiguous basis in the specification as filed.

Item 3.1 – Novelty

In the WO-IPEA, the Examiner did not take into account the amendments to the claims accompanying the Demand when assessing the relevance of the prior art and repeated

EUROPEAN PATENT ATTORNEYS | CHARTERED PATENT ATTORNEYS | EUROPEAN TRADE MARK ATTORNEYS | CHARTERED TRADE MARK ATTORNEYS | GERMAN PATENT ATTORNEYS

Offices located throughout the UK and Europe

Mathys & Squire is the trading name of Mathys & Squire LLP, a limited liability partnership registered in England & Wales under registered number OC335375 and regulated by IPReg and Mathys & Squire Europe Patentanwälte Partnerschaft mbB (Partner: Dr. Gerold Flesser, Andreas Wietzke, Dr. Matthias Brittinger; Bankverbindung: IBAN: 05 7015 0000 1006 0148 21; BIC: 55KMD333XXX). The registered office for the LLP is The Shard, 32 London Bridge Street, London SE1 9SG, and for the Partnerschaft mbB, Theatiner Str. 7, 80333 München. A list of the members of each company is open to inspection at the registered offices. Our German patent attorneys are subject to the rules of the Patentanwaltsordnung. We use the word 'partner' to refer to members of the LLP, Partnerschaft mbB or employees or consultants of similar seniority. 'MATHYS & SQUIRE' and the cube device are registered trade marks of Mathys & Squire LLP.

the objections raised in the WO-ISA against the original claims, in particular that the claims 1-7 and 9-30 lack novelty in view of US 2012/270129 (D1), WO 2022/043303 (D2), EP 4117085 (D3), and US 2019/0225855 (D4).

Having regard to the comments above and the amended claims enclosed herewith, Applicant requests the Examiner's consideration of the comments accompanying the Demand in respect of D1 to D3, repeated below for convenience, as well as the further comments set forth below in connection with D4.

Regarding D1, the Written Opinion notes that it discloses a heat transfer fluid comprising a liquid coolant, a siloxane corrosion inhibitor of formula $R_3\text{-Si-[O-Si(R)}_2\text{]}_x\text{OSiR}_3$, wherein R is independently an alkyl group or a polyalkylene oxide copolymer of 1 to 200 carbons, x is from 0 to 100, and further wherein at least one alkyl group and at least one polyalkylene oxide copolymer are present. Amended claims 1 and 27 enclosed herewith exclude the siloxane corrosion inhibitors described by D1 and that are essential to D1's heat transfer fluids. As such, D1 cannot and does not destroy the novelty of the amended claims.

Regarding D2, the Written Opinion notes that its heat transfer compounds require at least one ester of orthosilicic acid or alkoxy alkylsilane and the Written Opinion points to Table 1 where tetraethoxysilane is exemplified. Such compounds, which are necessary to D2's heat transfer compounds, are excluded by amended claims 1 and 27 enclosed herewith. As such, D2 cannot and does not destroy the novelty of the amended claims.

Regarding D3, the Written Opinion notes that its heat transfer compounds require at least one ester of orthosilicic acid or alkoxy alkylsilane and the Written Opinion points to examples 3-5 in Table 2a where tetraethoxysilane is exemplified. Such compounds, which are necessary to D3's heat transfer compounds, are excluded by amended claims 1 and 27 enclosed herewith. As such, D3 cannot and does not destroy the novelty of the current claims.

Turning to D4, the Written Opinion notes that this document describes a heat transfer concentrate that necessarily includes a carboxylic acid (see e.g., paras. [0008], [0009], claim 1). D4 provides exemplary formulas in Tables 4, 5, and 6. However, D4 is silent with respect to the conductivity of its heat transfer fluids. It is noted that D4 mentions that the water used in its heat transfer fluid may have a conductivity less than about 300 $\mu\text{S/cm}$ (see para. [0034]).

However, that does not represent a clear and unambiguous disclosure of the conductivity of the heat transfer or thermal management system fluid being less than or equal to about 500 $\mu\text{S/cm}$. On the contrary, the skilled person would note that the pH of each of D4's exemplified compositions is at least 8 (formula K, which contains the lowest amount of carboxylic acid of the exemplified compositions) and often greater than 8, and in fact assume that the compositions exemplified in D4 had conductivity values exceeding 500 $\mu\text{S/cm}$, contrary to the requirements of the claim.

To any extent that the Examiner believes that the claimed conductivity feature of the claims is implicit or otherwise inherently disclosed by the D4 disclosure, then it is apparent that the Examiner has not discharged the burden of showing that there is clear and unambiguous disclosure within the D4 document of that feature, or shown that the

inevitable consequence of working the D4 disclosure is something falling within the scope of the amended claims enclosed herewith.

For instance, it is apparent that the objection relating to D4 does not discharge the burden of evidencing a novelty objection according to EPO practice. Reference in that regard is made to EPO Board of Appeal decision, T793/93. As the Examiner will be aware, this Decision referred to a situation in which the relevant prior art document had failed to disclose explicitly something falling within a claim. In Item 2.1 of the Reasons, the Board held that:

“...in deciding what is or is not the inevitable outcome of an express literal disclosure in a particular prior art document, a standard of proof much stricter than the balance of probability, to wit **"beyond all reasonable doubt", needs to be applied**. It follows that if any reasonable doubt exists as to what might or might not be the result of carrying out the literal disclosure and instructions of a prior art document, in other words if there remains a "grey area", then the case on anticipation based on such a document **must fail**" [Emphasis Added]

In view of the foregoing comments, it is considered clear that there are significant doubts over the disclosure of the conductivity feature of the claims in D4 and thus, in view of T793/93, a case of anticipation by D4 cannot succeed. Accordingly, the subject-matter of the amended claims is also novel over D4.

Item 4 – Inventive Step

None of the cited prior art documents direct or even suggest the particular combination of claimed features, or teach the advantages associated therewith. As a consequence, it is considered apparent that the subject-matter of the amended claims is also inventive.

Michael J Stott
For and on behalf of
MATHYS & SQUIRE
Association No 171

Enc: Replacement claims 1 to 30 (clean and marked-up copies)

/mjs

Bitte beachten Sie, dass angeführte Nichtpatentliteratur (wie z. B. wissenschaftliche oder technische Dokumente) je nach geltendem Recht dem Urheberrechtsschutz und/oder anderen Schutzarten für schriftliche Werke unterliegen könnte. Die Vervielfältigung urheberrechtlich geschützter Texte, ihre Verwendung in anderen elektronischen oder gedruckten Publikationen und ihre Weitergabe an Dritte ist ohne ausdrückliche Zustimmung des Rechtsinhabers nicht gestattet.

Bitte beachten Sie, dass das EPA Dokumente der Patentliteratur, die in Recherchen- und Prüfungsverfahren nach dem EPÜ und dem PCT angeführt sind, nicht mehr als Papierkopie per Post versendet. Anmelder, die nicht die Mailbox nutzen, können die betreffenden Dokumente über Espacenet (<https://worldwide.espacenet.com/>) einsehen.

Veuillez noter que les ouvrages de la littérature non-brevets qui sont cités, par exemple les documents scientifiques ou techniques, etc., peuvent être protégés par des droits d'auteur et/ou toute autre protection des écrits prévue par les législations applicables. Les textes ainsi protégés ne peuvent être reproduits ni utilisés dans d'autres publications électroniques ou imprimées, ni rediffusés sans l'autorisation expresse du titulaire du droit d'auteur.

Veuillez noter que l'OEB n'envoie plus par voie postale de copies papier de la littérature brevet citée dans les procédures de recherche et d'examen au titre de la CBE ou du PCT. Les demandeurs qui n'utilisent pas la Mailbox peuvent accéder à ces documents dans Espacenet (<https://worldwide.espacenet.com/>).

Please be aware that cited works of non-patent literature such as scientific or technical documents or the like may be subject to copyright protection and/or any other protection of written works as appropriate based on applicable laws. Copyrighted texts may not be copied or used in other electronic or printed publications or re-distributed without the express permission of the copyright holder.

Please note that the EPO no longer sends paper copies by post of patent literature cited in search and examination proceedings under the EPC and PCT. Applicants not using the Mailbox can access such documents via Espacenet (<https://worldwide.espacenet.com/>).

XS2006100103CF August 2024