

**PATENT COOPERATION TREATY**

**PCT**

**INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY**

(Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44bis)

Applicant's or agent's file reference <b>160355WO01</b>	<b>FOR FURTHER ACTION</b>		See item 4 below
International application No. <b>PCT/JP2017/029817</b>	International filing date ( <i>day/month/year</i> ) <b>21 August 2017 (21.08.2017)</b>	Priority date ( <i>day/month/year</i> ) <b>23 August 2016 (23.08.2016)</b>	
International Patent Classification (8th edition unless older edition indicated) <b>See relevant information in Form PCT/ISA/237</b>			
Applicant <b>AGC INC.</b>			

<p>1. This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 bis.1(a).</p> <p>2. This REPORT consists of a total of 8 sheets, including this cover sheet.</p> <p>In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.</p>																								
<p>3. This report contains indications relating to the following items:</p> <table border="0"> <tr> <td><input checked="" type="checkbox"/></td> <td>Box No. I</td> <td>Basis of the report</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. II</td> <td>Priority</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. III</td> <td>Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. IV</td> <td>Lack of unity of invention</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>Box No. V</td> <td>Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. VI</td> <td>Certain documents cited</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. VII</td> <td>Certain defects in the international application</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. VIII</td> <td>Certain observations on the international application</td> </tr> </table> <p>4. The International Bureau will communicate this report to designated Offices in accordance with Rules 44bis.3(c) and 93bis.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44bis .2).</p>	<input checked="" type="checkbox"/>	Box No. I	Basis of the report	<input type="checkbox"/>	Box No. II	Priority	<input type="checkbox"/>	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability	<input type="checkbox"/>	Box No. IV	Lack of unity of invention	<input checked="" type="checkbox"/>	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement	<input type="checkbox"/>	Box No. VI	Certain documents cited	<input type="checkbox"/>	Box No. VII	Certain defects in the international application	<input type="checkbox"/>	Box No. VIII	Certain observations on the international application
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	Date of issuance of this report <b>26 February 2019 (26.02.2019)</b>
The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer  <b>Yukari Nakamura</b>
Facsimile No. +41 22 338 82 70	e-mail: pct.team7@wipo.int

**PATENT COOPERATION TREATY**

**TRANSLATION**

From the  
INTERNATIONAL SEARCHING AUTHORITY

**PCT**

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

To:

Date of mailing (day/month/year)	<b>07.11.2017</b>
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Applicant's or agent's file reference <b>160355W001</b>	<b>FOR FURTHER ACTION</b> See paragraph 2 below
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International application No. <b>PCT/JP2017/029817</b>	International filing date (day/month/year) <b>21.08.2017</b>	Priority date (day/month/year) <b>23.08.2016</b>
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International Patent Classification (IPC) or both national classification and IPC  
**C03C3/087 (2006.01) i, C03C3/091 (2006.01) i, C03C3/093 (2006.01) i**

Applicant  
**AGC INC.**

1. This opinion contains indications relating to the following items:

- Box No. I Basis of the opinion
- 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 Rule 43bis.1(a)(i) 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

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

Name and mailing address of the ISA/JP	Date of completion of this opinion	Authorized officer
Facsimile No.		Telephone No.

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Box No. I Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of:
  - 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 (Rules 12.3(a) and 23.1(b)).
2.  This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43bis.1(a))
3.  With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing:
  - a.  forming part of the international application as filed:
    - in the form of an Annex C/ST.25 text file.
    - on paper or in the form of an image file.
  - b.  furnished together with the international application under PCT Rule 13ter.1(a) for the purposes of international search only in the form of an Annex C/ST.25 text file.
  - c.  furnished subsequent to the international filing date for the purposes of international search only:
    - in the form of an Annex C/ST.25 text file (Rule 13ter.1(a)).
    - on paper or in the form of an image file (Rule 13ter.1(b) and Administrative Instructions, Section 713).
4.  In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that forming part of the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
5. Additional comments:

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<b>Box No. V</b>	<b>Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</b>		
1. Statement			
Novelty (N)	Claims	2	YES
	Claims	1, 3-14	NO
Inventive step (IS)	Claims	2	YES
	Claims	1, 3-14	NO
Industrial applicability (IA)	Claims	1-14	YES
	Claims		NO
2. Citations and explanations:			
<p>Document 1: WO 2012/077609 A1 (ASAHI GLASS CO., LTD.) 14 June 2012, paragraph [0033], tables 1-5 &amp; US 2013/0274086 A1, tables 1-5 &amp; US 2016/0002095 A1 &amp; EP 2650262 A1 &amp; CN 103261109 A &amp; KR 10-2013-0129971 A &amp; TW 201223910 A</p> <p>Document 2: US 2013/0210962 A1 (OCV INTELLECTUAL CAPITAL, LLC.) 15 August 2013, table 4 &amp; WO 2012/001656 A2 &amp; CN 103038185 A</p> <p>Document 3: JP 61-236631 A (OHARA OPTICAL GLASS MFG. CO., LTD.) 21 October 1986, table 1 (Family: none)</p> <p>Document 4: JP 2014-500848 A (SCHOTT AG.) 16 January 2014, tables 3-5 &amp; US 2014/0005027 A1, tables 3-5 &amp; WO 2012/076289 A2 &amp; DE 102010054967 A &amp; CN 103249688 A</p> <p style="margin-top: 20px;">The invention as in claims 1 and 3-14 lacks novelty and does not involve an inventive step in the light of document 1 cited in the ISR.</p>			

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**Box No. V** Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Document 1 (paragraph [0033], tables 1-5) discloses examples (see examples 1-7, 9-13, 15, 17-25, 28 and 30-31) judged as being alkali-free glasses which are characterized by containing, in mol% on an oxide basis, 65-75 of SiO<sub>2</sub>, 9-15 of Al<sub>2</sub>O<sub>3</sub>, 0-3 of B<sub>2</sub>O<sub>3</sub>, 0-12 of MgO, 0-8 of CaO, 0-6 of SrO, and 0-5 of BaO, wherein MgO + CaO + SrO + BaO is 12-22, 4.84[Fe<sub>2</sub>O<sub>3</sub>] + 5.65[Na<sub>2</sub>O] + 4.03[K<sub>2</sub>O] + 4.55[SnO<sub>2</sub>] is 0.55 or less, and having a compaction of 80 ppm or less.

Document 1 does not explicitly indicate that the compaction is 50 ppm or less, but paragraph [0033] indicates that it is preferable to suppress compaction, and because the composition of the alkali-free glass is the same as that in the present invention, it is considered that the invention disclosed in document 1 will have a compaction of 50 ppm or less.

Therefore, the invention as in claims 1 and 3-14 is identical to the invention disclosed in document 1.

The invention as in claims 1 and 3-14 lacks novelty and does not involve an inventive step in the light of document 2 cited in the ISR.

Document 2 (table 4) discloses an example (example 2) judged as being an alkali-free glass which is characterized by containing, in mol% on an oxide basis, 65-75 of SiO<sub>2</sub>, 9-15 of Al<sub>2</sub>O<sub>3</sub>, 0-3 of B<sub>2</sub>O<sub>3</sub>, 0-12 of MgO, 0-8 of CaO, 0-6 of SrO, and 0-5 of BaO, wherein MgO + CaO + SrO + BaO is 12-22, 4.84[Fe<sub>2</sub>O<sub>3</sub>] + 5.65[Na<sub>2</sub>O] + 4.03[K<sub>2</sub>O] + 4.55[SnO<sub>2</sub>] is 0.55 or less, and having a compaction of 80 ppm or less.

Document 2 does not explicitly indicate that the

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**Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

compaction is 50 ppm or less, but because the composition of the alkali-free glass is the same as that in the present invention, it is considered that the invention disclosed in document 2 will have a compaction of 50 ppm or less.

Therefore, the invention as in claims 1 and 3-14 is identical to the invention disclosed in document 2.

The invention as in claims 1 and 3-14 lacks novelty and does not involve an inventive step in the light of document 3 cited in the ISR.

Document 3 (table 1) discloses examples assessed as being alkali-free glasses which are characterized by containing, in mol% on an oxide basis, 65-75 of SiO<sub>2</sub>, 9-15 of Al<sub>2</sub>O<sub>3</sub>, 0-3 of B<sub>2</sub>O<sub>3</sub>, 0-12 of MgO, 0-8 of CaO, 0-6 of SrO, and 0-5 of BaO, wherein MgO + CaO + SrO + BaO is 12-22, 4.84[Fe<sub>2</sub>O<sub>3</sub>] + 5.65[Na<sub>2</sub>O] + 4.03[K<sub>2</sub>O] + 4.55[SnO<sub>2</sub>] is 0.55 or less, and having a compaction of 80 ppm or less (see no. 10, 13).

Document 3 does not explicitly indicate that the compaction is 50 ppm or less, but because the composition of the alkali-free glass is the same as that in the present invention, it is considered that the invention disclosed in document 3 will have a compaction of 50 ppm or less.

Therefore, the invention as in claims 1 and 3-14 is identical to the invention disclosed in document 3.

The invention as in claims 1 and 3-11 lacks novelty and does not involve an inventive step in the light of document 4 cited in the ISR.

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**Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

Document 4 (tables 3-5) discloses examples (C5 in table 3; E1 and E2 in table 4; C16 in table 5) judged as being alkali-free glasses which are characterized by containing, in mol% on an oxide basis, 65-75 of SiO<sub>2</sub>, 9-15 of Al<sub>2</sub>O<sub>3</sub>, 0-3 of B<sub>2</sub>O<sub>3</sub>, 0-12 of MgO, 0-8 of CaO, 0-6 of SrO, and 0-5 of BaO, wherein MgO + CaO + SrO + BaO is 12-22, 4.84[Fe<sub>2</sub>O<sub>3</sub>] + 5.65[Na<sub>2</sub>O] + 4.03[K<sub>2</sub>O] + 4.55[SnO<sub>2</sub>] is 0.55 or less, and having a compaction of 80 ppm or less.

Document 4 does not explicitly indicate that the compaction is 50 ppm or less, but because the composition of the alkali-free glass is the same as that in the present invention, it is considered that the invention disclosed in document 4 will have a compaction of 50 ppm or less.

Therefore, the invention as in claims 1 and 3-14 is identical to the invention disclosed in document 4.

The invention as in claims 12-14 lacks novelty in the light of document 4 cited in the ISR.

A person skilled in the art could have used, as appropriate, the invention disclosed in document 4 (tables 3-5) as a display substrate glass having a metal or oxide thin film or the like on a surface, or could have used, as appropriate, in a liquid crystal display device, an organic EL device or a lighting device (if necessary, see documents 1-3).

The invention as in claim 2 is novel and involves an inventive step in relation to the documents cited in the ISR.

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**Box No. V** Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

None of the documents cited in the ISR discloses an alkali-free glass containing, in mol% on an oxide basis, 65-70 of SiO<sub>2</sub>, 9-15 of Al<sub>2</sub>O<sub>3</sub>, 0-3 of B<sub>2</sub>O<sub>3</sub>, 5-12 of MgO, 3-8 of CaO, 1-6 of SrO, 0-4 of BaO, 0.001-0.03 of Fe<sub>2</sub>O<sub>3</sub>, 0.003-0.06 of Na<sub>2</sub>O, 0-0.02 of K<sub>2</sub>O, 0-0.12 of SnO<sub>2</sub> and 0-2 of ZrO<sub>2</sub>, wherein MgO + CaO + SrO + BaO is 15-22, MgO/(MgO + CaO + SrO + BaO) is 0.33 or more, MgO/(MgO + CaO) is 0.40 or more, MgO/(MgO + SrO) is 0.45 or more, and  $4.84[\text{Fe}_2\text{O}_3] + 5.65[\text{Na}_2\text{O}] + 4.03[\text{K}_2\text{O}] + 4.55[\text{SnO}_2]$  is 0.55 or less.