

# PATENT COOPERATION TREATY

# PCT

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44*bis*)

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|------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|--------------------------------------------------------------------------|------------------|
| Applicant's or agent's file reference<br>84457-WO-PCT                                                                        | <b>FOR FURTHER ACTION</b>                                                            |                                                                          | See item 4 below |
| International application No.<br>PCT/US2022/079549                                                                           | International filing date ( <i>day/month/year</i> )<br>09 November 2022 (09.11.2022) | Priority date ( <i>day/month/year</i> )<br>12 November 2021 (12.11.2021) |                  |
| International Patent Classification (IPC) or national classification and IPC<br>See relevant information in Form PCT/ISA/237 |                                                                                      |                                                                          |                  |
| Applicant<br>DOW GLOBAL TECHNOLOGIES LLC                                                                                     |                                                                                      |                                                                          |                  |

|                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                  |           |                     |                          |            |          |                          |             |                                                                                                  |                          |            |                            |                                     |           |                                                                                                                                                                  |                                     |            |                         |                          |             |                                                  |                                     |              |                                                       |
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| 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 <i>bis</i> . I(a).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                  |           |                     |                          |            |          |                          |             |                                                                                                  |                          |            |                            |                                     |           |                                                                                                                                                                  |                                     |            |                         |                          |             |                                                  |                                     |              |                                                       |
| 2.                                  | This REPORT consists of a total of 6 sheets, including this cover sheet.<br><br>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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                  |           |                     |                          |            |          |                          |             |                                                                                                  |                          |            |                            |                                     |           |                                                                                                                                                                  |                                     |            |                         |                          |             |                                                  |                                     |              |                                                       |
| 3.                                  | <p>This report contains indications relating to the following items:</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 10%; text-align: center;"><input checked="" type="checkbox"/></td> <td style="width: 30%;">Box No. I</td> <td style="width: 80%;">Basis of the report</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>Box No. II</td> <td>Priority</td> </tr> <tr> <td style="text-align: center;"><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 style="text-align: center;"><input type="checkbox"/></td> <td>Box No. IV</td> <td>Lack of unity of invention</td> </tr> <tr> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td>Box No. V</td> <td>Reasoned statement under Article 35(2) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement</td> </tr> <tr> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td>Box No. VI</td> <td>Certain documents cited</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>Box No. VII</td> <td>Certain defects in the international application</td> </tr> <tr> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td>Box No. VIII</td> <td>Certain observations on the international application</td> </tr> </table> | <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 and industrial applicability; citations and explanations supporting such statement | <input checked="" type="checkbox"/> | Box No. VI | Certain documents cited | <input type="checkbox"/> | Box No. VII | Certain defects in the international application | <input checked="" type="checkbox"/> | Box No. VIII | Certain observations on the international application |
| <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 and industrial applicability; citations and explanations supporting such statement |           |                     |                          |            |          |                          |             |                                                                                                  |                          |            |                            |                                     |           |                                                                                                                                                                  |                                     |            |                         |                          |             |                                                  |                                     |              |                                                       |
| <input checked="" type="checkbox"/> | Box No. VI                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Certain documents cited                                                                                                                                          |           |                     |                          |            |          |                          |             |                                                                                                  |                          |            |                            |                                     |           |                                                                                                                                                                  |                                     |            |                         |                          |             |                                                  |                                     |              |                                                       |
| <input type="checkbox"/>            | Box No. VII                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Certain defects in the international application                                                                                                                 |           |                     |                          |            |          |                          |             |                                                                                                  |                          |            |                            |                                     |           |                                                                                                                                                                  |                                     |            |                         |                          |             |                                                  |                                     |              |                                                       |
| <input checked="" type="checkbox"/> | Box No. VIII                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Certain observations on the international application                                                                                                            |           |                     |                          |            |          |                          |             |                                                                                                  |                          |            |                            |                                     |           |                                                                                                                                                                  |                                     |            |                         |                          |             |                                                  |                                     |              |                                                       |
| 4.                                  | The International Bureau will communicate this report to designated Offices in accordance with Rules 44 <i>bis</i> .3(c) and 93 <i>bis</i> .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 44 <i>bis</i> .2).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                  |           |                     |                          |            |          |                          |             |                                                                                                  |                          |            |                            |                                     |           |                                                                                                                                                                  |                                     |            |                         |                          |             |                                                  |                                     |              |                                                       |

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|-----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
|                                                                                               | Date of issuance of this report<br>02 May 2024 (02.05.2024)                       |
| The International Bureau of WIPO<br>34, chemin des Colombettes<br>1211 Geneva 20, Switzerland | Authorized officer<br><br><b>Yukari Nakamura</b><br><br>e-mail pct.team7@wipo.int |

# PATENT COOPERATION TREATY

From the  
INTERNATIONAL SEARCHING AUTHORITY

To:

see form PCT/ISA/220

## PCT

### WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.1)

Date of mailing  
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference  
see form PCT/ISA/220

**FOR FURTHER ACTION**  
See paragraph 2 below

International application No.  
PCT/US2022/079549

International filing date (day/month/year)  
09.11.2022

Priority date (day/month/year)  
12.11.2021

International Patent Classification (IPC) or both national classification and IPC  
INV. B32B7/10 B32B7/12 B32B27/08 B32B27/16 B32B27/20 B32B27/32 C08J5/18

Applicant  
DOW GLOBAL TECHNOLOGIES LLC

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 and 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 usually 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:



European Patent Office  
D-80298 Munich  
Tel. +49 89 2399 - 0  
Fax: +49 89 2399 - 4465

Date of completion of  
this opinion

see form  
PCT/ISA/210

Authorized Officer

Bergmans, Koen

Telephone No. +49 89 2399-0



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**Box No. I Basis of the opinion**

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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 43*bis*.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.
  - b. ☐ furnished subsequent to the international filing date for the purposes of international search (Rule 13*ter*.1(a)),
    - ☐ accompanied by a statement to the effect that the sequence listing does not go beyond the disclosure in the international application as filed.
4. ☐ With regard to any nucleotide and/or amino acid sequence disclosed in the international application, this opinion has been established to the extent that a meaningful opinion could be formed without a WIPO Standard ST.26 compliant sequence listing.
5. Additional comments:

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

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1. Statement

|                               |             |                |
|-------------------------------|-------------|----------------|
| Novelty (N)                   | Yes: Claims | <u>9-14</u>    |
|                               | No: Claims  | <u>1-8, 15</u> |
| Inventive step (IS)           | Yes: Claims |                |
|                               | No: Claims  | <u>1-15</u>    |
| Industrial applicability (IA) | Yes: Claims | <u>1-15</u>    |
|                               | No: Claims  |                |

2. Citations and explanations

**see separate sheet**

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**Box No. VI    Certain documents cited**

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1. Certain published documents (Rules 43*bis*.1 and 70.10)  
and / or
2. Non-written disclosures (Rules 43*bis*.1 and 70.9)  
**see form 210**

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**Box No. VIII    Certain observations on the international application**

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The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

**see separate sheet**

**Re Item V**

**Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

**Novelty (Art. 33 (2) PCT)**

Documents D1 WO2022224103 and D2 WO2022224104 are directed to BOPE film or film structure comprising at least three layers and having good optical properties.

Document D3 WO2021079255 discloses a biaxially oriented multilayer film used in food packaging applications. At least one layer and preferably the core layer comprises a blend of HDPE polymer with a MDPE polymer (density of 0.95 g/cm<sup>3</sup>) characterised by its density, melt index, polydispersity and molecular weight Mz. The subject matter of claims 1-15 over D3 is considered to be not novel (Art. 33(2) PCT).

Document D4 EP3291960 discloses a film (biaxial oriented from a sheet) used in food packaging applications. The multilayer film is biaxial oriented and comprises at least one layer made of bimodal or multimodal HDPE polymer material characterised by its density, polydispersity, melt index and molecular weight characteristics as Mn, Mw and Mz. The subject matter of claims 1-8 and 15 over D4 is considered to be not novel (Art. 33(2) PCT).

Document D5 BE1025436 discloses a multilayer film used in food packaging application and prepared from three layers (two skin layers and one core layer) all comprising multimodal HDPE polymer materials. The difference with the present invention is the specific and defined features of the HDPE polymeric material (not disclosed).

**Inventive step (Art. 33(3) PCT)**

The object of the present invention is to provide a BOPE multilayer film that is recyclable, has suitable stiffness, and good processability.

The technical features of the present claims are described in the documents D3, D4 and D5.

Unless the applicant is able to show by appropriate comparison tests that a film as claimed in the present application has an effect over a film disclosed in the prior art, the evidence contained in the present application cannot be taken into consideration for the evaluation of inventive step (Art. 33(3) PCT).

Whenever a comparative test is made, the comparison must be done over the technically closest prior art, in a comparable type of use.

**Re Item VI**

**Certain documents cited**

D1 published on 27.10.2022, filed on 14.04.2022 and claiming priority from 19.04.2021.

D2 published on 27.10.2022, filed on 14.04.2022 and claiming priority from 19.04.2021.

The priority documents pertaining to the present application were not available at the time of establishing this first written opinion. Hence, it is based on the assumption that claims 1 to 15 enjoy priority rights from the filing date of the priority document. If later turns out that this is not correct, the above documents D1 and D2 cited in the international search report could become relevant to assess whether the subject matter of claims 1-15 satisfies the criteria set forth in Art. 33(3) PCT.

**Re Item VIII**

**Certain observations on the international application**

**Clarity (Art. 6 PCT)**

Claim 1 of the present application does not meet the requirements of Article 6 PCT in that the matter for which protection is sought is not clearly defined. The term multimodal indicate that there are at least two polymers present with a different molecular weight. It is not clear from the claim if the defined polymer is the low molecular weight or high polymer weight polymer. At present any polyethylene composition comprising a polymer with the defined features (density, melt index and polydispersity) is interpreted as novelty destroying independent on the density of the composition. Moreover, the term multimodal high density polyethylene need to be further identified to clarify the subject-matter in claim 1.

Claim 1 of the present application does not meet the requirements of Article 6 PCT in that the matter for which protection is sought is not clearly defined. The applicant is kindly invited to include the standard test method used to determine the polydispersity (different from molecular weight distribution) and molecular weight Mz and Mw & Mn (claims 7,8).

Claim 13 of the present application does not meet the requirements of Article 6 PCT in that the matter for which protection is sought is not clearly defined. The applicant is kindly invited to include the standard test method used to determine the haze.

Claim 14 of the present application does not meet the requirements of Article 6 PCT in that the matter for which protection is sought is not clearly defined. The applicant is kindly invited to include the standard test method used to determine the second modulus.