### PATENT ASSIGNMENT COVER SHEET

**SUBMISSION TYPE:** NEW ASSIGNMENT  
**NATURE OF CONVEYANCE:** ASSIGNMENT  

#### CONVEYING PARTY DATA  
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<td>WONIK IPS CO., LTD.</td>
<td>04/21/2016</td>
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#### RECEIVING PARTY DATA  
| Name                  | WONIK IPS CO., LTD. |
| Street Address        | 75, JINWISANDAN-RO, JINWI-MYEON |
| City                  | PYEONGTAEK-SI, GYEONGGI-DO |
| State/Country         | KOREA, REPUBLIC OF |
| Postal Code           | 17709 |

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**CORRESPONDENCE DATA**

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**ATTORNEY DOCKET NUMBER:** BIP-0108-MS  
**NAME OF SUBMITTER:** JAE Y. PARK  
**SIGNATURE:** /Jae Y. Park/  
**DATE SIGNED:** 04/26/2016

Total Attachments: 9  
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UNITED STATES PATENT RIGHTS, OR
UNITED STATES PLUS ALL FOREIGN PATENT RIGHTS

ASSIGNMENT

WHEREAS, WONIK IPS CO., LTD., a corporation organized and existing under the laws of the Republic Of Korea, having its principal place of business at 332-L, Cheongho-ri, Jinwi-myeon, Pyeongtaek-si, Gyeonggi-do, Republic of Korea (hereinafter referred to as "Assignor"), is the owner of the entire right, title and interest in the following United States patents:

Title: APPARATUS FOR DEPOSITING THIN FILMS ON SEMICONDUCTOR WAFER

U.S. Patent No.: 6,183,563

Date of Patent: 02/06/2001

U.S. Patent Application No.: 09/313,765

Title: APPARATUS AND METHOD FOR DEPOSITING THIN FILM ON WAFER USING ATOMIC LAYER DEPOSITION

U.S. Patent No.: 6,579,372

Date of Patent: 06/17/2003

U.S. Patent Application No.: 09/848,579
Title: ATOMIC LAYER DEPOSITION (ALD) THIN FILM DEPOSITION EQUIPMENT HAVING CLEANING APPARATUS AND CLEANING METHOD

U.S. Patent No.: 6,796,316
Date of Patent: 09/28/2004
U.S. Patent Application No.: 09/848,533

Title: REACTOR FOR DEPOSITING THIN FILM ON WAFER

U.S. Patent No.: 6,852,168
Date of Patent: 02/08/2005
U.S. Patent Application No.: 09/848,577

Title: THIN FILM DEPOSITION REACTOR

U.S. Patent No.: 6,884,297
Date of Patent: 04/26/2005
U.S. Patent Application No.: 10/804,912

Title: SHOWERHEAD APPARATUS FOR RADICAL-ASSISTED DEPOSITION
U.S. Patent No.: 6,435,428

Date of Patent: 08/20/2002

U.S. Patent Application No.: 09/776,004

Title: PLASMA CHEMICAL VAPOR DEPOSITION APPARATUS

U.S. Patent No.: 6,886,491

Date of Patent: 05/03/2005

U.S. Patent Application No.: 10/102,108

Title: METHOD OF DEPOSITING THIN FILM USING HAFNIUM COMPOUND

U.S. Patent No.: 7,163,719

Date of Patent: 01/16/2007

U.S. Patent Application No.: 10/712,876

Title: A DEPOSITION METHOD OF TIN THIN FILM HAVING A MULTI-LAYER STRUCTURE

U.S. Patent No.: 7,253,101
Title: METHOD OF MANUFACTURING SEMICONDUCTOR DEVICE

U.S. Patent No.: 8,367,549

Date of Patent: 02/05/2013

U.S. Patent Application No.: 12/845,481

Title: SURFACE PROCESSING METHOD OF SILICON SUBSTRATE FOR SOLAR CELL, AND MANUFACTURING METHOD OF SOLAR CELL

U.S. Patent No.: 8,673,676

Date of Patent: 03/18/2014

U.S. Patent Application No.: 12/973,345

Title: METHOD FOR MANUFACTURING SOLAR CELL AND SOLAR CELL MANUFACTURED BY THE SAME METHOD

U.S. Patent No.: 8,741,160

Date of Patent: 06/03/2014

U.S. Patent Application No.: 12/973,367
Title: METHOD OF FORMING CHALCOGENIDE THIN FILM

U.S. Patent No.: 8,772,077

Date of Patent: 07/08/2014

U.S. Patent Application No.: 12/936,563

Title: APPARATUS FOR SEMICONDUCTOR PROCESSING

U.S. Patent No.: 8,741,096

Date of Patent: 06/03/2014

U.S. Patent Application No.: 11,770,117

Title: METHOD OF MANUFACTURING MULTI-LEVEL METAL THIN FILM
AND APPARATUS FOR MANUFACTURING THE SAME

U.S. Patent No.: 8,980,742

Date of Patent: 03/17/2015

U.S. Patent Application No.: 13/060,404
WHEREAS, WONIK IPS CO., LTD., a corporation organized and existing under the laws of Republic Of Korea, having a place of business at 75, Jinwisandan-ro, Jinwi-myeon, Pyeongtaek-si, Gyeonggi-do, Republic of Korea (17709); its heirs, successors, legal representatives and assigns (hereinafter referred to as “Assignee”), is desirous of acquiring the entire right, title and interest in and to the patents and the inventions therein disclosed;

NOW, THEREFORE, TO ALL WHOM IT MAY CONCERN, be it known that, for good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Assignor does hereby assign, sell, transfer and set over unto the Assignee all of its right, title and interest in and to the patents, and any and all applications for patent and patents therefor in the United States and in all foreign countries, including all divisions, reissues, continuations and extensions thereof, and all rights of priority resulting from the filing of the patents and applications thereof.

The Assignor hereby authorizes and requests the Patent and Trademark Office Officials in the United States of America and in any foreign countries to issue any and all Letters Patents resulting from the patents and applications thereof or any continuing, divisional conversion or reissue applications thereof to the Assignee, and hereby covenants that the Assignor has the full right to convey the...
entire interest herein assigned, and that the Assignor has not executed, and will not execute, any agreement in conflict herewith.

The undersigned declare that all statements made herein of his/her/their own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the patents and applications thereof or any patent issuing thereon.

In WITNESS WHEREOF, the Assignor has caused this Assignment to be executed by its duly authorized officer this 31st day of April, 2016.

By: [Signature]

Name: Yoon Hee Ha

Title: Executive VP (CHF)