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| <b>PATENT ASSIGNMENT COVER SHEET</b> |
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Electronic Version v1.1  
 Stylesheet Version v1.2

EPAS ID: PAT7650008

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| <b>SUBMISSION TYPE:</b>            | NEW ASSIGNMENT                                       |
| <b>NATURE OF CONVEYANCE:</b>       | ASSIGNMENT OF SECURITY INTEREST IN PATENT COLLATERAL |
| <b>CONVEYING PARTY DATA</b>        |  |
| <b>Name</b>                        | <b>Execution Date</b>                                |
| BARCLAYS BANK PLC                  | 11/15/2022   |
| <b>RECEIVING PARTY DATA</b>        |  |
| <b>Name:</b>                       | CITIBANK, N.A.                                       |
| <b>Street Address:</b>             | 388 GREENWICH STREET                                 |
| <b>Internal Address:</b>           | 7TH FLOOR  |
| <b>City:</b>                       | NEW YORK   |
| <b>State/Country:</b>              | NEW YORK   |
| <b>Postal Code:</b>                | 10013  |
| <b>PROPERTY NUMBERS Total: 442</b> |  |
| <b>Property Type</b>               | <b>Number</b>  |
| Application Number:                | 10271511   |
| Application Number:                | 15265385   |
| Application Number:                | 15286759   |
| Application Number:                | 15302712   |
| Application Number:                | 15326224   |
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| <b>Property Type</b> | <b>Number</b> |
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| <b>Property Type</b> | <b>Number</b> |
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| Application Number: | 10462977 |
| Application Number: | 11267435 |
| Application Number: | 10805769 |
| Application Number: | 10970881 |
| Application Number: | 12037429 |

**CORRESPONDENCE DATA**

**Fax Number:** (212)751-4864

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**Address Line 4:** NEW YORK, NEW YORK 10020

**ATTORNEY DOCKET NUMBER:** 030786-0725

**NAME OF SUBMITTER:** ANGELA M. AMARU

**SIGNATURE:** /s/Angela M. Amaru

**DATE SIGNED:** 11/17/2022

**Total Attachments: 37**

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**ASSIGNMENT OF SECURITY INTEREST IN  
PATENT COLLATERAL**

This ASSIGNMENT OF SECURITY INTEREST IN PATENT COLLATERAL (this "Assignment"), dated as of November 15, 2022, is entered into by and between BARCLAYS BANK PLC ("Assignor") and CITIBANK, N.A. ("Assignee"). All capitalized terms used herein and not otherwise defined shall have the respective meanings given to such terms in the Patent Security Agreement referred to below, whether directly therein, or by reference to another agreement.

WHEREAS, pursuant to that certain Pledge and Security Agreement, dated as of January 31, 2019 (as amended, restated, amended and restated, supplemented or otherwise modified from time to time, the "Pledge and Security Agreement") among Assignor and Alent, Inc., Alpha Assembly Solutions Inc., MacDermid Acumen, Inc., MacDermid Enthone America LLC, MacDermid Enthone Inc., MacDermid Graphics Solutions, LLC, MacDermid Offshore Solutions, LLC, MacDermid, Incorporated and Napp Systems Inc. (each a "Grantor" and collectively the "Grantors") and certain other parties, the Grantors executed and delivered that certain Patent Security Agreement, dated as of January 31, 2019 (the "Patent Security Agreement"), pursuant to which each Grantor granted to Assignor, for the ratable benefit of the Secured Parties, a security interest in, all of all of the Patent Collateral of such Grantor, including the patents and patent applications of such Grantor listed on Schedule I hereto;

WHEREAS, Assignor recorded the Patent Security Agreement with the United States Patent and Trademark Office on February 5, 2019 at Reel/Frame 048260/0613 (with respect to the Patent Collateral of Alent, Inc.), at Reel/Frame 048260/0683 (with respect to the Patent Collateral of Alpha Assembly Solutions, Inc.), at Reel/Frame 048260/0828 (with respect to the Patent Collateral of MacDermid Acumen, Inc.), at Reel/Frame 048261/0110 (with respect to the Patent Collateral of MacDermid Enthone Inc.), at Reel/Frame 049855/0001 (with respect to the Patent Collateral of MacDermid Graphics Solutions, LLC), at Reel/Frame 049823/0055 (with respect to the Patent Collateral of MacDermid Offshore Solutions, LLC), at Reel/Frame 048262/0321 (with respect to the Patent Collateral of MacDermid, Incorporated), and at Reel/Frame 048261/0356 (with respect to the Patent Collateral of Napp Systems, Inc.);

WHEREAS, Assignor has resigned as collateral agent, and Assignee has been appointed as the successor collateral agent, and accordingly Assignor has assigned to Assignee, and Assignee has assumed, all of Assignor's rights and obligations under the Pledge and Security Agreement and the Patent Security Agreement and the security interests granted thereunder; and

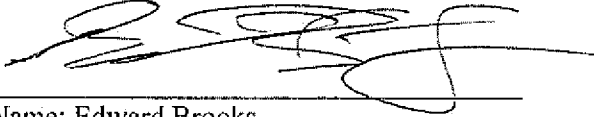
WHEREAS, Assignor and Assignee desire to confirm the foregoing assignment and assumption in this Assignment for purposes of recording it with the United States Patent and Trademark Office.

NOW, THEREFORE, for good and valuable consideration, receipt of which is hereby acknowledged, Assignor hereby assigns to Assignee, and Assignee hereby assumes, all of Assignor's right, title and interest in, to and under, the Patent Collateral and the Patent Security Agreement, including, without limitation, its security interest in the Patent Collateral. The foregoing Assignment is made without recourse, representations or warranties of any kind.

[Signature Pages Follow]

IN WITNESS WHEREOF, Assignor has duly executed this ASSIGNMENT OF SECURITY INTEREST IN PATENT COLLATERAL as of the date first above written.

**BARCLAYS BANK PLC.**  
as Assignor

By:   
Name: Edward Brooks  
Title: Vice President

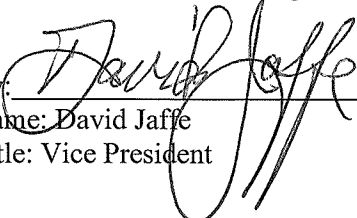


**ACCEPTANCE AND ASSUMPTION**

Assignee, as successor collateral agent, accepts and assumes the foregoing Assignment.

DATED as of the 15 day of November, 2022.

**CITIBANK, N.A., as Assignee**

By:   
Name: David Jaffe  
Title: Vice President

[Signature Page to Assignment of Security Interest in Patent Collateral]

**PATENT**  
**REEL: 061956 FRAME: 0659**

**SCHEDULE I  
PATENTS AND PATENT APPLICATIONS**

**SCHEDULE I**  
**TO**  
**PATENT SECURITY AGREEMENT**

PATENTS AND PATENT APPLICATIONS:

| Owner                                      | Title  | Application No. | Filing Date | Patent No. | Issue Date | Status    |
|--|--|-----------------|-------------|------------|------------|-----------|
| Alent, Inc.                                | RELEASEABLE MICROCAPSULE AND ADHESIVE CURING SYSTEM USING THE SAME               | 10/271,511      | 10/16/2002  | 6,936,644  | 8/30/2005  | Granted   |
| Alpha Assembly Solutions Inc.              | Production of Graphene   | 15/265385       | 9/14/2016   |            |            | Published |
| Alpha Assembly Solutions Inc.              | Advanced Solder Alloys for Electronic Interconnects                              | 15/286759       | 10/6/2016   |            |            | Published |
| Alpha Assembly Solutions Inc.              | Method for Manufacturing Metal Powder  | 15/302712       | 10/7/2016   | 10130995   | 11/20/2018 | Granted   |
| Alpha Assembly Solutions Inc.              | Stretchable Interconnects for Flexible Electronic Surfaces                       | 15/326224       | 1/16/2017   |            |            | Published |
| Alpha Assembly Solutions Inc.              | Low Temperature High Reliability Alloy for Solder Hierarchy                      | 15/326180       | 1/13/2017   |            |            | Published |
| Alpha Assembly Solutions Inc.              | Engineered Residue Solder Paste Technology                                       | 15/318829       | 12/14/2016  |            |            | Published |
| Alpha Assembly Solutions Inc.              | High Reliability Lead-Free Solder Alloy  |                 | 5/2/2017    |            |            | Pending   |
| Alpha Assembly Solutions Inc. <sup>1</sup> | Particles and Inks and Films Using Them  | 13/168465       | 6/24/2011   | 9217088    | 12/22/2015 | Granted   |
| Alpha Assembly Solutions Inc.              | Conductive Patterns and Methods of Using Them                                    | 15/439555       | 2/22/2017   |            |            | Published |
| Alpha Assembly Solutions Inc.              | Method for Producing a High Aspect Ratio Conductive Pattern on a Substrate       | 11/857871       | 9/19/2007   | 9615463    | 4/4/2017   | Granted   |
| Alpha Assembly Solutions Inc.              | Materials for Use with Interconnectors of Electrical Devices and Related Methods | 11/873838       | 10/17/2007  | 10123430   | 11/6/2018  | Granted   |
| Alpha Assembly Solutions Inc.              | Solder Preforms and Solder Alloy Assembly Methods                                | 15/716963       | 9/27/2017   |            |            | Published |

<sup>1</sup> Appropriate documentation to be filed with the USPTO to update owner name from Alpha Metals, Inc.

| Owner                                      | Title  | Application No. | Filing Date | Patent No. | Issue Date | Status    |
|--|--|-----------------|-------------|------------|------------|-----------|
| Alpha Assembly Solutions Inc.              | Solder Preforms and Solder Alloy Assembly Methods  | 14/386601       | 3/15/2013   | 9801285    | 10/24/2017 | Granted   |
| Alpha Assembly Solutions Inc.              | Flux Formulations  | 15/390861       | 12/27/2016  | 9751159    | 9/5/2017   | Granted   |
| Alpha Assembly Solutions Inc.              | Dual Side Reinforcement Flux for Encapsulation   | 14/908986       | 1/29/2016   | 9786629    | 10/10/2017 | Granted   |
| Alpha Assembly Solutions Inc.              | Rosin-Free Thermosetting Flux Formulations   | 15/109352       |             | 6/30/2016  | 10/31/2017 | Granted   |
| Alpha Assembly Solutions Inc.              | Composite and Multilayered Silver Films for Joining Electrical and Mechanical Components | 14/915067       | 2/26/2016   |            |            | Published |
| Alpha Assembly Solutions Inc.              | Lead-Free, Silver-Free Solder Alloys   | 15/028988       | 4/13/2016   |            |            | Published |
| Alpha Assembly Solutions Inc.              | Electrical Connection Tape   | 15/549535       | 8/8/2017    |            |            | Published |
| Alpha Assembly Solutions Inc.              | Sintering Materials and Attachment Methods Using Same                                    | 15/316684       | 12/6/2016   |            |            | Published |
| Alpha Assembly Solutions Inc.              | RF SHIELD WITH SELECTIVELY INTEGRATED SOLDER   | 15/426320       | 2/7/2017    |            |            | Published |
| Alpha Assembly Solutions Inc.              | Conductive Compositions and Methods of Using Them  | 15/148320       | 5/6/2016    | 10059827   | 8/28/2018  | Granted   |
| Alpha Assembly Solutions Inc.              | Conductive Compositions and Methods of Using Them  | 12/567523       | 9/25/2009   | 8564140    | 10/22/2013 | Granted   |
| Alpha Assembly Solutions Inc.              | Conductive Compositions and Methods of Using Them  | 14/058553       | 10/21/2013  | 9355938    | 5/31/2016  | Granted   |
| Alpha Assembly Solutions Inc.              | HIGH IMPACT TOUGHNESS ALLOY  | 15/644331       | 7/7/2017    |            |            | Published |
| Alpha Assembly Solutions Inc.              | HIGH IMPACT SOLDER TOUGHNESS ALLOY   | 16/003202       | 6/8/2018    |            |            | Published |
| Alpha Assembly Solutions Inc.              | METAL RECOVERY   | 14/900493       | 12/21/2015  |            |            | Published |
| Alpha Assembly Solutions Inc.              | JOINING TO ALUMINIUM   | 14/909888       | 2/3/2016    | 10065274   | 9/4/2018   | Granted   |
| Alpha Assembly Solutions Inc.              | Applications of Engineered Graphenes   | 62/655409       | 4/10/2018   |            |            | Pending   |
| Alpha Assembly Solutions Inc.              | Sintered Nano Copper Paste and Film  | 62/689962       | 6/26/2018   |            |            | Pending   |
| Alpha Assembly Solutions Inc.              | Engineered Flux for Solder Paste   |                 |             |            |            | Unfiled   |
| Alpha Assembly Solutions Inc. <sup>2</sup> | Soldering Flux Vehicle Additive and Fine Pitch Printing Method                           | 10036952        | 12/21/2001  | 6936115    | 8/30/2005  | Granted   |
| Alpha Assembly Solutions Inc. <sup>3</sup> | Flip chip with integrated flux and underfill   | 09067381        | 4/27/1998   | 6265776    | 7/24/2001  | Granted   |

<sup>2</sup> Appropriate documentation to be filed with the USPTO to update owner name from Alpha Metals, Inc.

<sup>3</sup> Appropriate documentation to be filed with the USPTO to update owner name from Alpha Metals, Inc.

| Owner                                       | Title   | Application No. | Filing Date | Patent No. | Issue Date | Status  |
|---|---|-----------------|-------------|------------|------------|---------|
| Alpha Assembly Solutions Inc. <sup>4</sup>  | Stencil incorporating electronic tag  | 09231490        | 1/14/1999   | 6123024    | 9/26/2000  | Granted |
| Alpha Assembly Solutions Inc. <sup>5</sup>  | Flip chip with integrated mask and underfill                                    | 09266166        | 3/10/1999   | 6228678    | 5/8/2001   | Granted |
| Alpha Assembly Solutions Inc. <sup>6</sup>  | Flip chip with integrated flux and underfill                                    | 09266232        | 3/10/1999   | 6194788    | 2/27/2001  | Granted |
| Alpha Assembly Solutions Inc. <sup>7</sup>  | Process for silver plating in printed circuit board manufacture                 | 09282729        | 3/31/1999   | 6319543    | 11/20/2001 | Granted |
| Alpha Assembly Solutions Inc. <sup>8</sup>  | Post-treatment for copper on printed circuit boards                             | 09345675        | 6/30/1999   | 6294220    | 9/25/2001  | Granted |
| Alpha Assembly Solutions Inc. <sup>9</sup>  | Wafer coating method for flip chips   | 09395553        | 9/14/1999   | 6323062    | 11/27/2001 | Granted |
| Alpha Assembly Solutions Inc. <sup>10</sup> | Flip chip having integral mask and underfill providing two-stage bump formation | 09395558        | 9/14/1999   | 6228681    | 5/8/2001   | Granted |
| Alpha Assembly Solutions Inc. <sup>11</sup> | Soldering Flux  | 09728264        | 12/1/2000   | 6599372    | 7/29/2003  | Granted |
| Alpha Assembly Solutions Inc. <sup>12</sup> | Low-residue, low-solder-ball flux   | 09834196        | 4/12/2001   | 6524398    | 2/25/2003  | Granted |
| Alpha Assembly Solutions Inc. <sup>13</sup> | Thermal interface material and heat sink configuration                          | 10151741        | 5/20/2002   | 6653741    | 11/25/2003 | Granted |
| Alpha Assembly Solutions Inc. <sup>14</sup> | Rapid surface cooling of solder droplets by flash evaporation                   | 10363420        | 8/15/2003   | 7097806    | 8/29/2006  | Granted |

<sup>4</sup> Appropriate documentation to be filed with the USPTO to update owner name from Alpha Metals, Inc.

<sup>5</sup> Appropriate documentation to be filed with the USPTO to update owner name from Alpha Metals, Inc.

<sup>6</sup> Appropriate documentation to be filed with the USPTO to update owner name from Alpha Metals, Inc.

<sup>7</sup> Appropriate documentation to be filed with the USPTO to update owner name from Alpha Metals, Inc.

<sup>8</sup> Appropriate documentation to be filed with the USPTO to update owner name from Alpha Metals, Inc.

<sup>9</sup> Appropriate documentation to be filed with the USPTO to update owner name from Alpha Metals, Inc.

<sup>10</sup> Appropriate documentation to be filed with the USPTO to update owner name from Alpha Metals, Inc.

<sup>11</sup> Appropriate documentation to be filed with the USPTO to update owner name from Alpha Metals, Inc.

<sup>12</sup> Appropriate documentation to be filed with the USPTO to update owner name from Alpha Metals, Inc.

<sup>13</sup> Appropriate documentation to be filed with the USPTO to update owner name from Alpha Metals, Inc.

<sup>14</sup> Appropriate documentation to be filed with the USPTO to update owner name from Alpha Metals, Inc.

| Owner                                       | Title  | Application No. | Filing Date | Patent No. | Issue Date | Status  |
|---|--|-----------------|-------------|------------|------------|---------|
| Alpha Assembly Solutions Inc. <sup>15</sup> | Thermoplastic fluxing underfill composition and method       | 10458925        | 6/11/2003   | 7166491    | 1/23/2007  | Granted |
| Alpha Assembly Solutions Inc. <sup>16</sup> | Thermal interface material and solder preforms               | 10722288        | 11/25/2003  | 7187083    | 3/6/2007   | Granted |
| Alpha Assembly Solutions Inc. <sup>17</sup> | UNDERFILL FLUXING CURATIVE                                   | 10817138        | 4/2/2004    | 7213739    | 5/8/2007   | Granted |
| Alpha Assembly Solutions Inc. <sup>18</sup> | METHOD OF APPLYING A PATTERN OF PARTICLES TO A SUBSTRATE     | 10888286        | 7/9/2004    | 7585549    | 9/8/2009   | Granted |
| Alpha Assembly Solutions Inc. <sup>19</sup> | COATING SOLDER METAL PARTICLES WITH A CHARGE DIRECTOR MEDIUM | 10888619        | 7/9/2004    | 7413771    | 8/19/2008  | Granted |
| Alpha Assembly Solutions Inc. <sup>20</sup> | COATED STENCIL WITH REDUCED SURFACE TENSION                  | 10899679        | 7/26/2004   | 7093746    | 8/22/2006  | Granted |
| Alpha Assembly Solutions Inc. <sup>21</sup> | LOW VOIDING NO FLOW FLUXING UNDERFILL FOR ELECTRONIC DEVICES | 10911908        | 8/5/2004    | 7247683    | 7/24/2007  | Granted |
| Alpha Assembly Solutions Inc. <sup>22</sup> | SOLDER PREFORMS FOR USE IN ELECTRONIC ASSEMBLY               | 11012457        | 12/15/2004  | 7533793    | 5/19/2009  | Granted |
| Alpha Assembly Solutions Inc. <sup>23</sup> | Multilayered Metal Nano and Micron Particles                 | 15318895        | 12/14/2016  |            |            | Pending |
| Alpha Assembly Solutions Inc. <sup>24</sup> | Jettable Inks For Solar Cell and Semiconductor Fabrication   | 15312799        | 11/21/2016  |            |            | Pending |

<sup>15</sup> Appropriate documentation to be filed with the USPTO to update owner name from Alpha Metals, Inc.

<sup>16</sup> Appropriate documentation to be filed with the USPTO to update owner name from Alpha Metals, Inc.

<sup>17</sup> Appropriate documentation to be filed with the USPTO to update owner name from Alpha Metals, Inc.

<sup>18</sup> Appropriate documentation to be filed with the USPTO to update owner name from Alpha Metals, Inc.

<sup>19</sup> Appropriate documentation to be filed with the USPTO to update owner name from Alpha Metals, Inc.

<sup>20</sup> Appropriate documentation to be filed with the USPTO to update owner name from Alpha Metals, Inc.

<sup>21</sup> Appropriate documentation to be filed with the USPTO to update owner name from Alpha Metals, Inc.

<sup>22</sup> Appropriate documentation to be filed with the USPTO to update owner name from Alpha Metals, Inc.

<sup>23</sup> Appropriate documentation to be filed with the USPTO to update owner name from Alpha Metals, Inc.

<sup>24</sup> Appropriate documentation to be filed with the USPTO to update owner name from Alpha Metals, Inc.

| Owner                                       | Title  | Application No. | Filing Date | Patent No. | Issue Date | Status  |
|---|--|-----------------|-------------|------------|------------|---------|
| Alpha Assembly Solutions Inc. <sup>25</sup> | Low Pressure Sintering Powder  | 15302827        | 10/7/2016   |            |            | Pending |
| Alpha Assembly Solutions Inc. <sup>26</sup> | Lead-free and antimony-free tin solder reliable at high temperatures | 14878056        | 10/8/2015   |            |            | Pending |
| Alpha Assembly Solutions Inc. <sup>27</sup> | Lead-free and antimony-free tin solder reliable at high temperatures | 14698450        | 4/28/2015   |            |            | Pending |
| Alpha Assembly Solutions Inc. <sup>28</sup> | Sintering powder   | 14438888        | 4/28/2015   |            |            | Pending |
| Alpha Assembly Solutions Inc. <sup>29</sup> | Lead-free and antimony-free tin solder reliable at high temperatures | 14434470        | 4/9/2015    |            |            | Pending |
| Alpha Assembly Solutions Inc. <sup>30</sup> | Systems and methods for void reduction in a solder joint             | 14347035        | 3/25/2014   |            |            | Pending |
| Alpha Assembly Solutions Inc. <sup>31</sup> | Solder compositions  | 14236480        | 3/21/2014   |            |            | Pending |
| Alpha Assembly Solutions Inc. <sup>32</sup> | High impact toughness solder alloy                                   | 14236432        | 3/21/2014   |            |            | Pending |
| Alpha Assembly Solutions Inc. <sup>33</sup> | Solvent systems for metals and inks                                  | 14095559        | 12/3/2013   |            |            | Pending |
| Alpha Assembly Solutions Inc. <sup>34</sup> | Methods for attachment and devices produced using the methods        | 14027530        | 9/16/2013   |            |            | Pending |

<sup>25</sup> Appropriate documentation to be filed with the USPTO to update owner name from Alpha Metals, Inc.

<sup>26</sup> Appropriate documentation to be filed with the USPTO to update owner name from Alpha Metals, Inc.

<sup>27</sup> Appropriate documentation to be filed with the USPTO to update owner name from Alpha Metals, Inc.

<sup>28</sup> Appropriate documentation to be filed with the USPTO to update owner name from Alpha Metals, Inc.

<sup>29</sup> Appropriate documentation to be filed with the USPTO to update owner name from Alpha Metals, Inc.

<sup>30</sup> Appropriate documentation to be filed with the USPTO to update owner name from Alpha Metals, Inc.

<sup>31</sup> Appropriate documentation to be filed with the USPTO to update owner name from Alpha Metals, Inc.

<sup>32</sup> Appropriate documentation to be filed with the USPTO to update owner name from Alpha Metals, Inc.

<sup>33</sup> Appropriate documentation to be filed with the USPTO to update owner name from Alpha Metals, Inc.

<sup>34</sup> Appropriate documentation to be filed with the USPTO to update owner name from Alpha Metals, Inc.

| Owner                                       | Title   | Application No. | Filing Date | Patent No. | Issue Date | Status  |
|---|---|-----------------|-------------|------------|------------|---------|
| Alpha Assembly Solutions Inc. <sup>35</sup> | Sintering materials and attachment methods using same           | 13287820        | 11/2/2011   |            |            | Pending |
| Alpha Assembly Solutions Inc. <sup>36</sup> | Flux formulations   | 12497065        | 7/2/2009    |            |            | Pending |
| Alpha Assembly Solutions Inc. <sup>37</sup> | Process for silver plating in printed circuit board manufacture | 13471203        | 5/14/2012   | RE45279    | 12/9/2014  | Granted |
| Alpha Assembly Solutions Inc. <sup>38</sup> | Process for silver plating in printed circuit board manufacture | 13655159        | 10/18/2012  | RE45175    | 10/7/2014  | Granted |
| Alpha Assembly Solutions Inc. <sup>39</sup> | Flux formulations   | 14077995        | 11/12/2013  | 9566668    | 2/14/2017  | Granted |
| Alpha Assembly Solutions Inc. <sup>40</sup> | Electrical contacts   | 12052104        | 3/20/2008   | 9362424    | 6/7/2016   | Granted |
| Alpha Assembly Solutions Inc. <sup>41</sup> | Solder alloy  | 11720578        | 7/25/2008   | 9221131    | 12/29/2015 | Granted |
| Alpha Assembly Solutions Inc. <sup>42</sup> | Solder alloy  | 12036497        | 2/25/2008   | 8641964    | 2/4/2014   | Granted |
| Alpha Assembly Solutions Inc. <sup>43</sup> | Solvent systems for metals and inks                             | 11857818        | 9/19/2007   | 8597548    | 12/3/2013  | Granted |
| Alpha Assembly Solutions Inc. <sup>44</sup> | Methods of attaching a die to a substrate                       | 12175375        | 7/17/2008   | 8555491    | 10/15/2013 | Granted |
| Alpha Assembly Solutions Inc. <sup>45</sup> | Methods for producing electrical conductors                     | 12052166        | 3/20/2008   | 8312623    | 11/20/2012 | Granted |

<sup>35</sup> Appropriate documentation to be filed with the USPTO to update owner name from Alpha Metals, Inc.

<sup>36</sup> Appropriate documentation to be filed with the USPTO to update owner name from Alpha Metals, Inc.

<sup>37</sup> Appropriate documentation to be filed with the USPTO to update owner name from Alpha Metals, Inc.

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<sup>43</sup> Appropriate documentation to be filed with the USPTO to update owner name from Alpha Metals, Inc.

<sup>44</sup> Appropriate documentation to be filed with the USPTO to update owner name from Alpha Metals, Inc.

<sup>45</sup> Appropriate documentation to be filed with the USPTO to update owner name from Alpha Metals, Inc.



| Owner                                       | Title  | Application No. | Filing Date | Patent No. | Issue Date | Status  |
|---|--|-----------------|-------------|------------|------------|---------|
| Alpha Assembly Solutions Inc. <sup>46</sup> | Electrical conductors and methods of making and using them                         | 12175381        | 7/17/2008   | 8304062    | 11/6/2012  | Granted |
| Alpha Assembly Solutions Inc. <sup>47</sup> | Metalllic particles for electrokinetic or electrostatic deposition                 | 12191691        | 8/14/2008   | 8252417    | 8/28/2012  | Granted |
| Alpha Assembly Solutions Inc. <sup>48</sup> | Reducing joint embrittlement in lead-free soldering processes                      | 12036604        | 2/25/2008   | 8191757    | 6/5/2012   | Granted |
| Alpha Assembly Solutions Inc. <sup>49</sup> | Particles and inks and films using them  | 11462089        | 8/3/2006    | 7968008    | 6/28/2011  | Granted |
| Alpha Assembly Solutions Inc. <sup>50</sup> | Electroformed stencils for solar cell front side metallization                     | 12201654        | 8/29/2008   | 7749883    | 7/6/2010   | Granted |
| Alpha Assembly Solutions Inc. <sup>51</sup> | Mask and method for electrokinetic deposition and patterning process on substrates | 11419128        | 5/18/2006   | 7678255    | 3/16/2010  | Granted |
| Alpha Assembly Solutions Inc. <sup>52</sup> | Thermal interface material and solder preforms                                     | 11682729        | 3/6/2007    | 7663242    | 2/16/2010  | Granted |
| Alpha Assembly Solutions Inc. <sup>53</sup> | Coated solder metal particles  | 12191710        | 8/14/2008   | 7655304    | 2/2/2010   | Granted |
| Alpha Assembly Solutions Inc. <sup>54</sup> | Preparation of metallic particles for electrokinetic or electrostatic deposition   | 11065764        | 2/25/2005   | 7413805    | 8/19/2008  | Granted |
| Alpha Assembly Solutions Inc.               | Materials for use with interconnects of electrical devices and related methods     | 11873838        | 10/17/2007  | 10123430   | 11/6/2018  | Granted |
| Alpha Assembly Solutions Inc.               | Advanced Solder Alloys For Electronic Interconnects                                | 15286759        | 10/6/2016   |            |            | Pending |
| Alpha Assembly Solutions Inc.               | Method for Die and Clip Attachment   | 15545607        | 7/21/2017   |            |            | Pending |

- <sup>46</sup> Appropriate documentation to be filed with the USPTO to update owner name from Alpha Metals, Inc.
- <sup>47</sup> Appropriate documentation to be filed with the USPTO to update owner name from Alpha Metals, Inc.
- <sup>48</sup> Appropriate documentation to be filed with the USPTO to update owner name from Alpha Metals, Inc.
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- <sup>54</sup> Appropriate documentation to be filed with the USPTO to update owner name from Alpha Metals, Inc.

| Owner                                       | Title   | Application No. | Filing Date | Patent No. | Issue Date | Status  |
|---|---|-----------------|-------------|------------|------------|---------|
| Alpha Assembly Solutions Inc.               | Engineered Polymer-Based Electronic Materials   | 15562195        | 9/27/2017   |            |            | Pending |
| Alpha Assembly Solutions Inc. <sup>55</sup> | Sintering Materials and Attachment Methods Using Same                                       | 15017975        | 2/8/2016    |            |            | Pending |
| Alpha Assembly Solutions Inc. <sup>56</sup> | High Impact Solder Toughness Alloy  | 15419564        | 1/30/2017   |            |            | Pending |
| Alpha Assembly Solutions Inc. <sup>57</sup> | Lead-Free Solder Compositions   | 62785293        | 12/27/2018  |            |            | Pending |
| MacDermid Acumen, Inc.                      | Process for Improving the Adhesion of Polymeric Materials to Metal Surfaces                 | 09/274641       | 3/23/1999   | 6162503    | 12/19/2000 | Granted |
| MacDermid Acumen, Inc.                      | Process for Enhancing the Adhesion of Organic Coatings to Metal Surfaces                    | 09/421204       | 10/21/1999  | 6206981    | 3/27/2001  | Granted |
| MacDermid Acumen, Inc.                      | Process for Improving the Adhesion of Polymeric Materials to Metal Surfaces                 | 09/590046       | 6/8/2000    | 6383272    | 5/7/2002   | Granted |
| MacDermid Acumen, Inc.                      | Process for Improving the Adhesion of Polymeric Materials to Metal Surfaces                 | 10/090048       | 2/27/2002   | 6503566    | 1/7/2003   | Granted |
| MacDermid Acumen, Inc.                      | Process for Improving the Adhesion of Polymeric Materials to Metal Surfaces                 | 09/643813       | 8/22/2000   | 6554948    | 4/29/2003  | Granted |
| MacDermid Acumen, Inc.                      | Method for Enhancing the Solderability of a Surface   | 09/677904       | 10/3/2000   | 6375822    | 4/23/2002  | Granted |
| MacDermid Acumen, Inc.                      | Flux Composition and Corresponding Soldering Method   | 09/672577       | 9/28/2000   | 6474536    | 11/5/2002  | Granted |
| MacDermid Acumen, Inc.                      | Method for the Manufacture of Printed Circuit Boards  | 09/687880       | 10/13/2000  | 6656370    | 12/2/2003  | Granted |
| MacDermid Acumen, Inc.                      | Paint Stripping Composition and Process Containing Methyl Benzoate and Formic Acid          | 09/949191       | 9/7/2001    | 6417149    | 7/9/2002   | Granted |
| MacDermid Acumen, Inc.                      | Composition and Process for Cleaning Inks from Various Substrates Including Printing Plates | 09/710976       | 11/9/2000   | 6261381    | 7/17/2001  | Granted |
| MacDermid Acumen, Inc.                      | Process for Enhancing the Adhesion of Organic Coatings to Metal Surfaces                    | 09/718910       | 11/22/2000  | 6379750    | 4/30/2002  | Granted |
| MacDermid Acumen, Inc.                      | Process & Composition for High Speed Plating of Tin & Tin Alloys                            | 09/965743       | 9/28/2001   | 6562221    | 5/13/2003  | Granted |

<sup>55</sup> Appropriate documentation to be filed with the USPTO to update owner name from Alpha Metals, Inc.

<sup>56</sup> Appropriate documentation to be filed with the USPTO to update owner name from Alpha Metals, Inc.

<sup>57</sup> Appropriate documentation to be filed with the USPTO to update owner name from Alpha Metals, Inc.

| Owner                                | Title  | Application No. | Filing Date | Patent No. | Issue Date | Status  |
|--------------------------------------|--|-----------------|-------------|------------|------------|---------|
| MacDermid Acumen, Inc.               | Method for the Manufacture of Printed Circuit Boards with Plated Resistors                                     | 09/784242       | 2/15/2001   | 6585904    | 7/1/2003   | Granted |
| MacDermid Acumen, Inc.               | Method for the Manufacture of Printed Circuit Boards with Plated Resistors                                     | 10/419651       | 4/21/2003   | 7034231    | 4/25/2006  | Granted |
| MacDermid Acumen, Inc.               | High Temperature Continuous Electrolysis of Electroless Plating Solutions                                      | 09/788766       | 2/20/2001   | 6391177    | 5/21/2002  | Granted |
| MacDermid Acumen, Inc.               | Composition & Method for Inhibiting Corrosion of Aluminum & Aluminum Alloys Using Mercapto Substituted Silanes | 09/802087       | 3/8/2001    | 6461682    | 10/8/2002  | Granted |
| MacDermid Acumen, Inc. <sup>58</sup> | Electroplating Composition and Process   | 09/803631       | 3/9/2001    | 6582582    | 6/24/2003  | Granted |
| MacDermid Acumen, Inc. <sup>59</sup> | Composition and Process for Inhibiting Corrosion of Metallic Substrates  | 09/906370       | 7/16/2001   | 6508958    | 1/21/2003  | Granted |
| MacDermid Acumen, Inc.               | Composition and Process for Inhibiting Corrosion of Metallic Substrates  | 10/328197       | 12/23/2002  | 6706214    | 3/16/2004  | Granted |
| MacDermid Acumen, Inc.               | Electroless Nickel Plating Solution & Process for its Use  | 09/945011       | 8/31/2001   | 6500482    | 12/31/2002 | Granted |
| MacDermid Acumen, Inc.               | Non-Chrome Passivation Process for Zinc & Zinc Alloys  | 09/938234       | 8/23/2001   | 6524403    | 2/25/2003  | Granted |
| MacDermid Acumen, Inc.               | Process for Plating Particulate Matter   | 09/946404       | 9/5/2001    | 6586047    | 7/1/2003   | Granted |
| MacDermid Acumen, Inc.               | Nonyanide Copper Plating Process for Zinc & Zinc Alloys  | 10/096411       | 3/12/2002   | 6827834    | 12/7/2004  | Granted |
| MacDermid Acumen, Inc.               | Magnesium Conversion Coating Composition and Method of Using Same  | 10/076897       | 2/14/2002   | 6692583    | 2/17/2004  | Granted |
| MacDermid Acumen, Inc.               | Method of Stripping Silver from a Printed Circuit Board  | 10/106522       | 3/25/2002   | 6783690    | 8/31/2004  | Granted |
| MacDermid Acumen, Inc.               | Method for the Manufacture of Printed Circuit Boards with Integral Plated Resistors                            | 10/271817       | 10/16/2002  | 6767445    | 7/27/2004  | Granted |
| MacDermid Acumen, Inc.               | Method of Fabricating Electronic Interconnect Devices Using Direct Imaging of Dielectric Composite Material    | 10/372747       | 2/24/2003   | 6762073    | 7/13/2004  | Granted |
| MacDermid Acumen, Inc.               | Coating for Silver Plated Circuits   | 10/412932       | 4/14/2003   | 6773757    | 8/10/2004  | Granted |

<sup>58</sup> Appropriate documentation to be filed with the USPTO to update owner name from Alpha Metals, Inc.

<sup>59</sup> Appropriate documentation to be filed with the USPTO to update owner name from Alpha Metals, Inc.

| Owner                  | Title  | Application No. | Filing Date | Patent No. | Issue Date | Status  |
|------------------------|--|-----------------|-------------|------------|------------|---------|
| MacDermid Acumen, Inc. | Polytetrafluoroethylene Dispersion for Electroless Nickel Plating Applications   | 10/431251       | 5/7/2003    | 6837923    | 1/4/2005   | Granted |
| MacDermid Acumen, Inc. | Method of Forming a Metal Pattern on a Substrate                                 | 10/820236       | 4/6/2004    | 7378225    | 5/27/2008  | Granted |
| MacDermid Acumen, Inc. | Protective U.V. Curable Cover Layer for Optical Media                            | 10/694375       | 10/27/2003  | 6972143    | 12/6/2005  | Granted |
| MacDermid Acumen, Inc. | Methods of Cleaning Copper Surfaces in the Manufacture of Printed Circuit Boards | 10/705026       | 11/10/2003  | 7063800    | 6/20/2006  | Granted |
| MacDermid Acumen, Inc. | Process for Preparing a Non-Conductive Substrate for Electroplating              | 10/798522       | 3/11/2004   | 7128820    | 10/31/2006 | Granted |
| MacDermid Acumen, Inc. | Selective Catalytic Activation of Non-Conductive Substrates                      | 10/837109       | 4/30/2004   | 7255782    | 8/14/2007  | Granted |
| MacDermid Acumen, Inc. | Pretreatment of Magnesium Substrates for Electroplating                          | 11/205516       | 8/17/2005   | 7704366    | 4/27/2010  | Granted |
| MacDermid Acumen, Inc. | Microetching Solution  | 11/209471       | 8/23/2005   | 7393461    | 7/1/2008   | Granted |
| MacDermid Acumen, Inc. | Developer Solution and Process for Use   | 11/290118       | 11/30/2005  | 7094523    | 8/22/2006  | Granted |
| MacDermid Acumen, Inc. | Microetching Composition and Method of Using the Same                            | 11/316010       | 12/21/2005  | 7456114    | 11/25/2008 | Granted |
| MacDermid Acumen, Inc. | Microetching Composition and Method of Using the Same                            | 11/893068       | 8/14/2007   | 7875558    | 1/25/2011  | Granted |
| MacDermid Acumen, Inc. | Copper Electroplating of Printing Cylinders                                      | 11/403628       | 4/13/2006   | 7153408    | 12/26/2006 | Granted |
| MacDermid Acumen, Inc. | Process for Electrolytically Plating Copper                                      | 11/398048       | 4/5/2006    | 7575666    | 8/18/2009  | Granted |
| MacDermid Acumen, Inc. | Process for Improving the Adhesion of Polymeric Materials to Metal Surfaces      | 11/503780       | 8/14/2006   | 7704562    | 4/27/2010  | Granted |
| MacDermid Acumen, Inc. | Metal Surface Treatment Composition  | 11/796660       | 4/27/2007   | 7645393    | 1/12/2010  | Granted |
| MacDermid Acumen, Inc. | Method of Recycling Electroless Nickel Waste                                     | 11/728757       | 3/27/2007   | 7833583    | 11/16/2010 | Granted |
| MacDermid Acumen, Inc. | Acid Copper Electroplating Bath Composition                                      | 11/821206       | 6/22/2007   | 7887693    | 2/15/2011  | Granted |
| MacDermid Acumen, Inc. | Process for Improving the Adhesion of Polymeric Materials to Metal Surfaces      | 12/350380       | 1/8/2009    | 8088246    | 1/3/2012   | Granted |
| MacDermid Acumen, Inc. | Acid-Resistance Promoting Composition  | 12/156613       | 6/3/2008    | 8518281    | 8/27/2013  | Granted |
| MacDermid Acumen, Inc. | Method for Enhancing the Solderability of a Surface                              | 12/244136       | 10/2/2008   | 7631798    | 12/15/2009 | Granted |
| MacDermid Acumen, Inc. | Process for Plating Chromium from a Trivalent Chromium Plating Bath              | 12/261352       | 10/30/2008  | 7780840    | 8/24/2010  | Granted |
| MacDermid Acumen, Inc. | Organic Polymer Coatings for Protection Against Creep Corrosion                  | 12/383650       | 3/27/2009   | 8263177    | 9/11/2012  | Granted |

| Owner                  | Title   | Application No. | Filing Date | Patent No. | Issue Date | Status    |
|------------------------|---|-----------------|-------------|------------|------------|-----------|
| MacDermid Acumen, Inc. | Chromium Alloy Coating with Enhanced Resistance to Corrosion in Calcium Chloride Environments | 12/409629       | 3/24/2009   | 9765437    | 9/19/2017  | Granted   |
| MacDermid Acumen, Inc. | Chromium Alloy Coating with Enhanced Resistance to Corrosion in Calcium Chloride Environments | 15/678771       | 8/16/2017   |            |            | Published |
| MacDermid Acumen, Inc. | Selective Deposition of Metal on Plastic Substrates   | 12/488158       | 6/19/2009   | 8974860    | 3/10/2015  | Granted   |
| MacDermid Acumen, Inc. | Surface Treatment of Silicon  | 12/509619       | 7/27/2009   | 7989346    | 8/2/2011   | Granted   |
| MacDermid Acumen, Inc. | Nickel-Chromium Alloy Stripper for Flexible Wiring Boards                                     | 12/573298       | 10/5/2009   | 8486281    | 7/16/2013  | Granted   |
| MacDermid Acumen, Inc. | Light Induced Plating of Metals on Silicon Photovoltaic Cells                                 | 13/681722       | 11/20/2012  | 8956687    | 2/17/2015  | Granted   |
| MacDermid Acumen, Inc. | Light Induced Electroless Plating   | 12/549547       | 8/28/2009   | 8722142    | 5/13/2014  | Granted   |
| MacDermid Acumen, Inc. | Light Induced Electroless Plating   | 13/188615       | 7/22/2011   | 8337942    | 12/25/2012 | Granted   |
| MacDermid Acumen, Inc. | Nano-Oxide Process for Bonding Copper/Copper Alloy and Resin                                  | 12/697425       | 2/1/2010    | 8308893    | 11/13/2012 | Granted   |
| MacDermid Acumen, Inc. | Method for Improving Plating on Non-Conductive Substrates                                     | 13/741446       | 1/15/2013   | 9067238    | 6/30/2015  | Granted   |
| MacDermid Acumen, Inc. | Method for Improving Plating on Non-Conductive Substrates                                     | 12/693548       | 1/26/2010   | 8974869    | 3/10/2015  | Granted   |
| MacDermid Acumen, Inc. | Improved Method of Producing Polymeric Phenazonium Compounds                                  | 14/181866       | 2/17/2014   | 9040700    | 5/26/2015  | Granted   |
| MacDermid Acumen, Inc. | Improved Method of Producing Polymeric Phenazonium Compounds                                  | 13/238832       | 9/21/2011   | 8735580    | 5/27/2014  | Granted   |
| MacDermid Acumen, Inc. | Method of Producing Polymeric Phenazonium Compounds   | 12/890013       | 9/24/2010   | 8691987    | 4/8/2014   | Granted   |
| MacDermid Acumen, Inc. | Dark Colored Chromium Based Electrodeposits   | 13/593690       | 8/24/2012   | 9347144    | 5/24/2016  | Granted   |
| MacDermid Acumen, Inc. | Dark Colored Chromium Based Electrodeposits   | 12/940249       | 11/5/2010   | 8273235    | 9/25/2012  | Granted   |
| MacDermid Acumen, Inc. | Electrolytic Dissolution of Chromium from Chromium Electrodes                                 | 12/947059       | 11/16/2010  | 8512541    | 8/20/2013  | Granted   |
| MacDermid Acumen, Inc. | Aluminum Treatment Compositions   | 13/021026       | 2/4/2011    | 8496762    | 7/30/2013  | Granted   |
| MacDermid Acumen, Inc. | Adhesion Promoting Composition for Metal Leadframes   | 13/954328       | 7/30/2013   | 9030008    | 5/12/2015  | Granted   |
| MacDermid Acumen, Inc. | Adhesion Promoting Composition for Metal Leadframes   | 13/018668       | 2/1/2011    | 8524540    | 9/3/2013   | Granted   |

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|------------------------|---|-----------------|-------------|------------|------------|-----------|
| MacDermid Acumen, Inc. | Color Control of Trivalent Chromium Deposits  | 13/398111       | 2/16/2012   | 9758884    | 9/12/2017  | Granted   |
| MacDermid Acumen, Inc. | Etching of Plastic Using Acidic Solutions Containing Trivalent Manganese                        | 14/467105       | 8/25/2014   |            |            | Published |
| MacDermid Acumen, Inc. | Etching of Plastic Using Acidic Solutions Containing Trivalent Manganese                        | 15/357385       | 11/21/2016  |            |            | Published |
| MacDermid Acumen, Inc. | Electrolytic Generation of Manganese (III) Ions in Strong Sulfuric Acid Using an Improved Anode | 13/677798       | 11/15/2012  | 9752241    | 9/5/2017   | Granted   |
| MacDermid Acumen, Inc. | Etching of Plastic Using Acidic Solutions Containing Trivalent Manganese                        | 13/356004       | 1/23/2012   |            |            | Published |
| MacDermid Acumen, Inc. | Electrolytic Generation of Manganese (III) Ions in Strong Sulfuric Acid                         | 13/795382       | 3/12/2013   | 9534306    | 1/3/2017   | Granted   |
| MacDermid Acumen, Inc. | Etching of Plastic Using Acidic Solutions Containing Trivalent Manganese                        | 15/934127       | 3/23/2018   |            |            | Published |
| MacDermid Acumen, Inc. | Additives for Producing Copper Electrodeposits Having Low Oxygen Content                        | 13/480887       | 5/25/2012   | 9243339    | 1/26/2016  | Granted   |
| MacDermid Acumen, Inc. | Regeneration of Etch Solutions Containing Trivalent Manganese in Acid Media                     | 13/870232       | 4/25/2013   |            |            | Appealed  |
| MacDermid Acumen, Inc. | Electroless Nickel Plating Solution and Method  | 13/961018       | 8/7/2013    |            |            | Published |
| MacDermid Acumen, Inc. | Aqueous Electroless Nickel Plating Bath and Method of Using the Same                            | 14/293216       | 6/2/2014    |            |            | Published |
| MacDermid Acumen, Inc. | Zinc and Zinc Alloy Electroplating Additives and Electroplating Methods                         | 10/333484       | 5/29/2003   | 7109375    | 9/19/2006  | Granted   |
| MacDermid Acumen, Inc. | Electrolyte Media for the Deposition of Tin Alloys and Methods for Depositing Tin Alloys        | 10/470792       | 7/30/2003   | 7309411    | 12/18/2007 | Granted   |
| MacDermid Acumen, Inc. | Electroplating of Metals on Transparent Conductive Oxide Substrates                             | 14/204241       | 3/11/2014   | 9783901    | 10/10/2017 | Granted   |
| MacDermid Acumen, Inc. | Passivation of Micro-Discontinuous Chromium Deposited from a Trivalent Electrolyte              | 14/200546       | 3/7/2014    |            |            | Appealed  |
| MacDermid Acumen, Inc. | High Phosphorus Electroless Nickel  | 14/294437       | 6/3/2014    | 9708693    | 7/18/2017  | Granted   |
| MacDermid Acumen, Inc. | Treatment for Electroplating Racks to Avoid Rack Metallization                                  | 14/454131       | 8/7/2014    | 9809899    | 11/7/2017  | Granted   |
| MacDermid Acumen, Inc. | Treatment of Etch Baths   | 14/870738       | 9/30/2015   |            |            | Published |
| MacDermid Acumen, Inc. | Dark Coloured Chromium Based Electrodeposits  | 15/134469       | 4/21/2016   |            |            | Published |

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|------------------------|--|-----------------|-------------|------------|------------|-----------|
| MacDermid Acumen, Inc. | Sealing Anodized Aluminum Using a Low-Temperature Nickel-Free Process  | 15/405417       | 1/13/2017   | 10138566   | 11/27/2018 | Published |
| MacDermid Acumen, Inc. | Electroless Silver Plating Bath and Method of Using the Same   | 14831403        | 8/20/2015   |            |            | Pending   |
| MacDermid Acumen, Inc. | Solutions of Organic Salts as Pretreatments for Plastic Prior to Etching                                       | 14831266        | 8/20/2015   |            |            | Pending   |
| MacDermid Acumen, Inc. | High Speed Copper Plating Process  | 13786728        | 3/6/2013    |            |            | Pending   |
| MacDermid Acumen, Inc. | Direct Electroless Palladium Plating on Copper   | 13609705        | 9/11/2012   |            |            | Pending   |
| MacDermid Acumen, Inc. | Steel Pre-Paint Treatment Composition  | 13568277        | 8/7/2012    |            |            | Pending   |
| MacDermid Acumen, Inc. | Additive for Use in Wash Step of PET Recycling Process   | 13438149        | 4/3/2012    |            |            | Pending   |
| MacDermid Acumen, Inc. | Coatings Having Enhanced Corrosion Performance and Method of Using the Same                                    | 13398242        | 2/16/2012   |            |            | Pending   |
| MacDermid Acumen, Inc. | Low Etch Process for Direct Metallization  | 13353428        | 1/19/2012   |            |            | Pending   |
| MacDermid Acumen, Inc. | PROCESS FOR PLATING UPON A POLYMERIC SURFACE   | 09183137        | 10/30/1998  | 6168836    | 1/2/2001   | Granted   |
| MacDermid Acumen, Inc. | Photosensitive resin composition useful in fabricating printing plates   | 09620884        | 7/21/2000   | 6197459    | 3/6/2001   | Granted   |
| MacDermid Acumen, Inc. | Photosensitive resin composition useful in fabricating printing plates   | 09143427        | 8/28/1998   | 6214522    | 4/10/2001  | Granted   |
| MacDermid Acumen, Inc. | Tin plating electrolyte compositions   | 09051784        | 12/17/1998  | 6217738    | 4/17/2001  | Granted   |
| MacDermid Acumen, Inc. | Method for the manufacture of printed circuit boards with plated resistors                                     | 09603978        | 6/27/2000   | 6281090    | 8/28/2001  | Granted   |
| MacDermid Acumen, Inc. | Fluxing agents for the reflowing of electro-deposited tinplate   | 09147972        | 11/3/1999   | 6409850    | 6/25/2002  | Granted   |
| MacDermid Acumen, Inc. | Process for improving the adhesion of polymeric materials to metal surfaces                                    | 09598857        | 6/21/2000   | 6419784    | 7/16/2002  | Granted   |
| MacDermid Acumen, Inc. | Direct imaging process for forming resist pattern on a surface, and use thereof in fabricating printing plates | 10190873        | 7/8/2002    | 6632588    | 10/14/2003 | Granted   |
| MacDermid Acumen, Inc. | Integral plated resistor and method for the manufacture of printed circuit boards comprising the same          | 10925589        | 8/25/2004   | 7022464    | 4/4/2006   | Granted   |
| MacDermid Acumen, Inc. | Process for improving the adhesion of polymeric materials to metal surfaces                                    | 10304514        | 11/26/2002  | 7186305    | 3/6/2007   | Granted   |

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|--|--|-----------------|-------------|------------|------------|-----------|
| MacDermid Acumen, Inc.   | Process for preparing a non-conductive substrate for electroplating  | 10964212        | 10/13/2004  | 7214304    | 5/8/2007   | Granted   |
| MacDermid Acumen, Inc.   | Method for the manufacture of printed circuit boards with plated resistors   | 11348941        | 2/6/2006    | 7279108    | 10/9/2007  | Granted   |
| MacDermid Acumen, Inc.   | Controlling the hardness of electrodeposited copper coatings by variation of current profile   | 10943113        | 9/16/2004   | 7329334    | 2/12/2008  | Granted   |
| MacDermid Acumen, Inc.   | Method of using ultrasonics to plate silver  | 11300254        | 12/14/2005  | 7429400    | 9/30/2008  | Granted   |
| MacDermid Acumen, Inc.   | Polyimide substrate and method of manufacturing printed wiring board using the same  | 11386631        | 3/22/2006   | 7666471    | 2/23/2010  | Granted   |
| MacDermid Acumen, Inc.   | Method of electrolytically dissolving nickel into electrodeless nickel plating solutions   | 12046864        | 3/12/2008   | 8177956    | 5/15/2012  | Granted   |
| MacDermid Acumen, Inc.   | Process for Improving Adhesion of Polymeric Materials to Metal Surfaces  | 12436260        | 5/6/2009    | 8512504    | 8/20/2013  | Granted   |
| MacDermid Acumen, Inc.   |  |                 |             |            |            |           |
| MacDermid Acumen, Inc. and Hewlett-Packard Development Company, L.P. | Method for automatically forming ink and media-dependent color transforms for diverse colored inks and ink types, validating color gamut, and applying said inks | 09260925        | 3/2/1999    | 6419340    | 7/16/2002  | Granted   |
| MacDermid Enthone Inc  | Inhibitor Composition for Racks When Using Chrome-Free Etches in a Plating on Plastics Process   | 15551052        | 8/15/2017   |            |            | Pending   |
| MacDermid Enthone Inc.   | Flexible Color Adjustment for Dark CR (III) Platings   | 15/762599       | 9/23/2016   |            |            | Published |
| MacDermid Enthone Inc.   | System and Process for Recovering Catalytic Precious Metal from Aqueous Galvanic Processing Solution   | 15/754224       | 8/15/2016   |            |            | Published |
| MacDermid Enthone Inc.   | Use of Water Soluble and Air Stable Phosphadamanatanes as stabilizer in Electrolytes for Electroless Metal Deposition  | 15/765637       | 10/6/2016   |            |            | Pending   |
| MacDermid Enthone Inc.   | Use of water soluble lanthanide compounds as stabilizer in electrolytes for electrodeless metal deposition   | 15/616540       | 6/7/2017    |            |            | Published |
| MacDermid Enthone Inc.   | Cobalt Filling of Interconnects  | 15/641756       | 7/5/2017    |            |            | Pending   |
| MacDermid Enthone Inc.   | Process for Metallization of Copper Pillars in the Manufacture of Microelectronics   | 15/617482       | 6/8/2017    |            |            | Pending   |



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|------------------------|--|-----------------|-------------|------------|------------|-----------|
| MacDermid Enthone Inc. | Leveler Compositions for use in Copper Deposition in Manufacture of Microelectronics                               | 15/412809       | 1/23/2017   |            |            | Published |
| MacDermid Enthone Inc. | Cobalt Filling of Interconnects in Microelectronics  | 15/739314       | 6/30/2016   |            |            | Pending   |
| MacDermid Enthone Inc. | SILVER PLATING IN ELECTRONICS MANUFACTURE [Silver]   | 14/666990       | 3/24/2015   | 9730321    | 8/8/2017   | Granted   |
| MacDermid Enthone Inc. | DEFECTIVITY AND PROCESS CONTROL OF ELECTROLESS DEPOSITION IN MICROELECTRONICS APPLICATIONS [Cobalt]                | 11/243,631      | 10/5/2005   | 7,611,988  | 11/3/2009  | Granted   |
| MacDermid Enthone Inc. | DEFECTIVITY AND PROCESS CONTROL OF ELECTROLESS DEPOSITION IN MICROELECTRONICS APPLICATIONS [Cobalt]                | 11/243,624      | 10/5/2005   | 7,611,987  | 11/3/2009  | Granted   |
| MacDermid Enthone Inc. | CORROSION PROTECTION OF BRONZES CHROMIUM-FREE PICKLE FOR PLASTIC SURFACES  | 11/766642       | 6/21/2007   | 10017863   | 7/10/2018  | Granted   |
| MacDermid Enthone Inc. | CHROMIUM-FREE PICKLE FOR PLASTIC SURFACES  | 14/702020       | 5/1/2015    | 9752074    | 9/5/2017   | Granted   |
| MacDermid Enthone Inc. | COMPOSITION AND METHOD FOR THE DEPOSITION OF CONDUCTIVE POLYMERS ON DIELECTRIC SUBSTRATES (ENVISION HD)            | 13/882330       | 2/5/2014    | 10021782   | 7/10/2018  | Granted   |
| MacDermid Enthone Inc. | PROCESS FOR FILLING VIAS IN THE MANUFACTURE OF MICROELECTRONICS (Anodic Pulse to Reduce Additive Build Up) [SC Cu] | 15/148738       | 5/6/2016    | 10103029   | 10/16/2018 | Granted   |
| MacDermid Enthone Inc. | AQUEOUS ELECTROLYTE COMPOSITION HAVING A REDUCED AIRBORNE EMISSION, METHOD AND USE OF THIS COMPOSITION             | 14/916706       | 3/4/2016    | 10081876   | 9/5/2018   | Granted   |
| MacDermid Enthone Inc. | LEVELERS FOR COPPER DEPOSITION IN MICROELECTRONICS   | 14/854561       | 9/15/2015   |            |            | Published |
| MacDermid Enthone Inc. | AQUEOUS STRIPPING COMPOSITION FOR METAL SURFACES   | 14/893854       | 11/24/2015  | 9834689    | 12/5/2017  | Granted   |
| MacDermid Enthone Inc. | COMPOSITIONS INCLUDING A HIGH MOLECULAR WEIGHT ACID SUITABLE FOR CONDUCTIVE POLYMER                                | 15/545208       | 7/20/2017   |            |            | Published |

| Owner                                | Title   | Application No. | Filing Date | Patent No. | Issue Date | Status  |
|--------------------------------------|---|-----------------|-------------|------------|------------|---------|
| MacDermid Enthone Inc.               | FORMATION ON DIELECTRIC SUBSTRATES  | 15/607925       | 5/30/2017   |            |            | Pending |
| MacDermid Enthone Inc.               | Elimination of H2S in Immersion Tin Plating Solution  | 15/717275       | 9/27/2017   |            |            | Pending |
| MacDermid Enthone Inc.               | Textured Hardcoat Films   | 15/973814       | 5/8/2018    |            |            | Pending |
| MacDermid Enthone Inc.               | Carbon Based Direct Plating Process   | 16/059086       | 8/9/2018    |            |            | Pending |
| MacDermid Enthone Inc.               | Electrolytic Deposition of Tin/Tin-X and Plating Method   |                 |             |            |            | Pending |
| MacDermid Enthone Inc.               | NEAR NEUTRAL pH PICKLE ON MULTI-METALS  | 15/977526       | 5/11/2018   |            |            | Pending |
| MacDermid Enthone Inc. <sup>60</sup> | Advanced Solder Alloys For Electronic Interconnects   | 15286759        | 10/6/2016   |            |            | Pending |
| MacDermid Enthone Inc. <sup>61</sup> | METHOD FOR DIRECT METALLIZATION OF NON-CONDUCTING SUBSTRATES                                      | 11423474        | 6/12/2006   |            |            | Pending |
| MacDermid Enthone Inc. <sup>62</sup> | METHOD AND DEVICE FOR COATING SUBSTRATE SURFACES  | 12278256        | 12/15/2008  |            |            | Pending |
| MacDermid Enthone Inc. <sup>63</sup> | CORROSION PROTECTION OF BRONZES   | 12665908        | 8/9/2010    |            |            | Pending |
| MacDermid Enthone Inc. <sup>64</sup> | Electrolyte and method for deposition of matte metal layer  | 13003398        | 6/15/2011   |            |            | Pending |
| MacDermid Enthone Inc. <sup>65</sup> | Method for deposition of hard chrome layers   | 13125622        | 4/22/2011   |            |            | Pending |
| MacDermid Enthone Inc. <sup>66</sup> | Corrosion-protective wax composition containing polyaniline in a doped form and a liquid paraffin | 13638442        | 1/9/2013    |            |            | Pending |

<sup>60</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.

<sup>61</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.

<sup>62</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.

<sup>63</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.

<sup>64</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.

<sup>65</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.

<sup>66</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.

| Owner                                | Title   | Application No. | Filing Date | Patent No. | Issue Date | Status  |
|--------------------------------------|---|-----------------|-------------|------------|------------|---------|
| MacDermid Enthone Inc. <sup>67</sup> | Copper filling of through silicon vias                                | 13699910        | 12/12/2012  |            |            | Pending |
| MacDermid Enthone Inc. <sup>68</sup> | Process for filling vias in the microelectronics                      | 13981974        | 1/8/2014    |            |            | Pending |
| MacDermid Enthone Inc. <sup>69</sup> | Aqueous solution and method for the formation of a passivation layer  | 14001360        | 2/10/2014   |            |            | Pending |
| MacDermid Enthone Inc. <sup>70</sup> | Apparatus for electrochemical deposition of a metal                   | 14234080        | 1/24/2014   |            |            | Pending |
| MacDermid Enthone Inc. <sup>71</sup> | Electrodeposition of silver with fluoropolymer nanoparticles          | 14776879        | 9/15/2015   |            |            | Pending |
| MacDermid Enthone Inc. <sup>72</sup> | Electrodeposition of Copper   | 15037267        | 5/17/2016   |            |            | Pending |
| MacDermid Enthone Inc. <sup>73</sup> | Copper Electrodeposition in Microelectronics                          | 15291340        | 10/12/2016  |            |            | Pending |
| MacDermid Enthone Inc. <sup>74</sup> | Ductility agents for nickel-tungsten alloys                           | 090446869       | 3/24/1998   | 6045682    | 4/4/2000   | Granted |
| MacDermid Enthone Inc. <sup>75</sup> | Electroless nickel cobalt phosphorous composition and plating process | 08963999        | 11/4/1997   | 6146702    | 11/14/2000 | Granted |
| MacDermid Enthone Inc. <sup>76</sup> | Water soluble brighteners for zinc and zinc alloy electrolytes        | 09394839        | 9/13/1999   | 6238542    | 5/29/2001  | Granted |
| MacDermid Enthone Inc. <sup>77</sup> | Bismuth coating protection for copper                                 | 09403900        | 1/18/2000   | 6331201    | 12/18/2001 | Granted |

<sup>67</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.

<sup>68</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.

<sup>69</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.

<sup>70</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.

<sup>71</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.

<sup>72</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.

<sup>73</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.

<sup>74</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.

<sup>75</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.

<sup>76</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.

<sup>77</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.

| Owner                                | Title   | Application No. | Filing Date | Patent No. | Issue Date | Status  |
|--------------------------------------|---|-----------------|-------------|------------|------------|---------|
| MacDermid Enthone Inc. <sup>78</sup> | Printed circuit board manufacture   | 08939656        | 9/29/1997   | 6395329    | 5/28/2002  | Granted |
| MacDermid Enthone Inc. <sup>79</sup> | Process for selective deposition of osp coating on copper, excluding deposition on gold     | 09383718        | 8/26/1999   | 6524644    | 2/25/2003  | Granted |
| MacDermid Enthone Inc. <sup>80</sup> | Chemical compounds made of intrinsically conductive polymers and metals                     | 09463453        | 4/17/2000   | 6632380    | 10/14/2003 | Granted |
| MacDermid Enthone Inc. <sup>81</sup> | Method for coating workpieces   | 09786300        | 7/13/2001   | 6635165    | 10/21/2003 | Granted |
| MacDermid Enthone Inc. <sup>82</sup> | Process for metallizing a plastic surface   | 09831008        | 5/3/2001    | 6712948    | 3/30/2004  | Granted |
| MacDermid Enthone Inc. <sup>83</sup> | System for the electrodialytic regeneration of an electrodeless bath electrolyte            | 10092976        | 3/7/2002    | 6723218    | 4/20/2004  | Granted |
| MacDermid Enthone Inc. <sup>84</sup> | Electroplating chemistry for the cu filling of submicron features of vlsi/ulsi interconnect | 09716975        | 11/20/2000  | 6776893    | 8/17/2004  | Granted |
| MacDermid Enthone Inc. <sup>85</sup> | Process for the extended use of electrolytes  | 10148090        | 10/3/2002   | 6797141    | 9/28/2004  | Granted |
| MacDermid Enthone Inc. <sup>86</sup> | Process for the non-galvanic tin plating of copper or copper alloys                         | 10129998        | 7/31/2002   | 6821323    | 11/23/2004 | Granted |
| MacDermid Enthone Inc. <sup>87</sup> | Method for the deposition of a chromium alloy   | 10169959        | 10/3/2002   | 6837981    | 1/4/2005   | Granted |
| MacDermid Enthone Inc. <sup>88</sup> | Printed circuit board manufacture   | 10118417        | 4/8/2002    | 6860925    | 3/1/2005   | Granted |

<sup>78</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.

<sup>79</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.

<sup>80</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.

<sup>81</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.

<sup>82</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.

<sup>83</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.

<sup>84</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.

<sup>85</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.

<sup>86</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.

<sup>87</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.

<sup>88</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.

| Owner                                | Title   | Application No. | Filing Date | Patent No. | Issue Date | Status  |
|--------------------------------------|---|-----------------|-------------|------------|------------|---------|
| MacDermid Enthone Inc. <sup>89</sup> | Copper bath composition for electrodeless and/or electrolytic filling of vias and trenches for integrated circuit fabrication | 10358596        | 2/5/2003    | 6897152    | 5/24/2005  | Granted |
| MacDermid Enthone Inc. <sup>90</sup> | ADHESION PROMOTION IN PRINTED CIRCUIT BOARDS  | 10619198        | 7/14/2003   | 7232478    | 6/19/2007  | Granted |
| MacDermid Enthone Inc. <sup>91</sup> | CAPPING OF METAL INTERCONNECTS IN INTEGRATED CIRCUIT ELECTRONIC DEVICES   | 10867346        | 6/14/2004   | 7268074    | 9/11/2007  | Granted |
| MacDermid Enthone Inc.               | COPPER ELECTRODEPOSITION IN MICROELECTRONICS  | 11272999        | 11/14/2005  | 7303992    | 12/4/2007  | Granted |
| MacDermid Enthone Inc.               | DEFECT REDUCTION IN ELECTRODEPOSITED COPPER FOR SEMICONDUCTOR APPLICATIONS  | 10091106        | 3/4/2002    | 7316772    | 1/8/2008   | Granted |
| MacDermid Enthone Inc. <sup>92</sup> | Cobalt and nickel electrodeless plating in microelectronic devices  | 11085304        | 3/21/2005   | 7332193    | 2/19/2008  | Granted |
| MacDermid Enthone Inc. <sup>93</sup> | Capping of metal interconnects in integrated circuit electronic devices   | 11/852,513      | 9/10/2007   | 7393781    | 7/1/2008   | Granted |
| MacDermid Enthone Inc. <sup>94</sup> | Defectivity and process control of electrodeless deposition in microelectronics applications                                  | 11230912        | 9/20/2005   | 7410899    | 8/12/2008  | Granted |
| MacDermid Enthone Inc. <sup>95</sup> | Method for treating laser-structured plastic surfaces   | 11102038        | 4/8/2005    | 7578888    | 8/25/2009  | Granted |

<sup>89</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.

<sup>90</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.

<sup>91</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.

<sup>92</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.

<sup>93</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.

<sup>94</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.

<sup>95</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.

| Owner                                 | Title   | Application No. | Filing Date | Patent No. | Issue Date | Status  |
|---------------------------------------|---|-----------------|-------------|------------|------------|---------|
| MacDermid Enthone Inc. <sup>96</sup>  | Method for etching non-conductive substrate surfaces  | 11554100        | 10/30/2006  | 7578947    | 8/25/2009  | Granted |
| MacDermid Enthone Inc. <sup>97</sup>  | Defectivity and process control of electrodeless deposition in microelectronics applications  | 11243876        | 10/5/2005   | 7615491    | 11/19/2009 | Granted |
| MacDermid Enthone Inc. <sup>98</sup>  | Insoluble anode   | 11279512        | 4/12/2006   | 7666283    | 2/23/2010  | Granted |
| MacDermid Enthone Inc. <sup>99</sup>  | Copper metallization of through silicon via   | 12185641        | 8/4/2008    | 7670950    | 3/2/2010   | Granted |
| MacDermid Enthone Inc. <sup>100</sup> | Adhesion promotion in printed circuit boards  | 11759456        | 6/7/2007    | 7682432    | 3/23/2010  | Granted |
| MacDermid Enthone Inc. <sup>101</sup> | Manufacture of electrodeless cobalt deposition compositions for microelectronics applications | 11549775        | 6/7/2007    | 7704306    | 4/27/2010  | Granted |
| MacDermid Enthone Inc. <sup>102</sup> | Tin-silver solder bumping in electronics manufacture  | 11463355        | 8/9/2006    | 7713859    | 5/11/2010  | Granted |
| MacDermid Enthone Inc. <sup>103</sup> | Organic solderability preservative comprising high boiling temperature alcohol                | 11620857        | 1/8/2007    | 7794531    | 9/14/2010  | Granted |
| MacDermid Enthone Inc. <sup>104</sup> | Direct metallization of electrically non-conductive polyimide substrate surfaces              | 11756048        | 5/31/2007   | 7815785    | 10/19/2010 | Granted |
| MacDermid Enthone Inc. <sup>105</sup> | Copper electrodeposition in microelectronics  | 11846385        | 8/28/2007   | 7815786    | 10/19/2010 | Granted |

<sup>96</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.

<sup>97</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.

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<sup>101</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.

<sup>102</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.

<sup>103</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.

<sup>104</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.

<sup>105</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.

| Owner                                 | Title   | Application No. | Filing Date | Patent No. | Issue Date | Status  |
|---------------------------------------|---|-----------------|-------------|------------|------------|---------|
| MacDermid Enthone Inc.                | Method for supplying a plating composition with deposition metal ion during a plating operation | 11420339        | 5/25/2006   | 7846316    | 12/7/2010  | Granted |
| MacDermid Enthone Inc. <sup>106</sup> | Process and electrolytes for deposition of metal layers   | 10678601        | 10/3/2003   | 7846503    | 12/7/2010  | Granted |
| MacDermid Enthone Inc. <sup>107</sup> | Metallie surface enhancement  | 11736647        | 4/18/2007   | 7883738    | 2/8/2011   | Granted |
| MacDermid Enthone Inc. <sup>108</sup> | Copper deposition for filling features in manufacture of microelectronic devices                | 12446176        | 4/17/2009   | 7968455    | 6/28/2011  | Granted |
| MacDermid Enthone Inc. <sup>109</sup> | Anti-tarnish coatings   | 11944287        | 11/21/2007  | 7972655    | 7/5/2011   | Granted |
| MacDermid Enthone Inc. <sup>110</sup> | Surface preparation process for damascene copper deposition                                     | 12238139        | 9/25/2008   | 7998859    | 8/16/2011  | Granted |
| MacDermid Enthone Inc. <sup>111</sup> | Copper electrodeposition in microelectronics  | 10963369        | 10/12/2004  | 8002962    | 8/23/2011  | Granted |
| MacDermid Enthone Inc. <sup>112</sup> | Maintenance of metallization baths  | 11039088        | 1/19/2005   | 8057678    | 11/15/2011 | Granted |
| MacDermid Enthone Inc. <sup>113</sup> | ADHESION PROMOTION IN PRINTED CIRCUIT BOARDS  | 11759624        | 6/7/2007    | 8142840    | 3/27/2012  | Granted |
| MacDermid Enthone Inc. <sup>114</sup> | ELECTROLYTE AND PROCESS FOR DEPOSITING A MATT METAL LAYER                                       | 12168680        | 7/7/2008    | 8192607    | 6/5/2012   | Granted |

- <sup>106</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.
- <sup>107</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.
- <sup>108</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.
- <sup>109</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.
- <sup>110</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.
- <sup>111</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.
- <sup>112</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.
- <sup>113</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.
- <sup>114</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.

| Owner                                 | Title  | Application No. | Filing Date | Patent No. | Issue Date | Status  |
|---------------------------------------|--|-----------------|-------------|------------|------------|---------|
| MacDermid Enthone Inc. <sup>115</sup> | METHOD FOR REMOVING IMPURITIES FROM A METAL DEPOSITION PROCESS SOLUTION  | 11563335        | 11/27/2006  | 8202431    | 6/19/2012  | Granted |
| MacDermid Enthone Inc. <sup>116</sup> | SELF ASSEMBLED MOLECULES ON IMMERSION SILVER COATINGS  | 12268144        | 11/10/2008  | 8216645    | 7/10/2012  | Granted |
| MacDermid Enthone Inc. <sup>117</sup> | COMPOSITE COATINGS FOR WHISKER REDUCTION   | 12254207        | 10/20/2008  | 8226807    | 7/24/2012  | Granted |
| MacDermid Enthone Inc. <sup>118</sup> | GALVANIC BATH AND PROCESS FOR DEPOSITING ZINC-BASED LAYERS   | 12617202        | 11/12/2009  | 8282806    | 10/9/2012  | Granted |
| MacDermid Enthone Inc. <sup>119</sup> | SILVER PLATING IN ELECTRONICS MANUFACTURE  | 10902398        | 7/29/2004   | 8349393    | 1/8/2013   | Granted |
| MacDermid Enthone Inc. <sup>120</sup> | DEPOSITION OF CONDUCTIVE POLYMER AND METALLIZATION OF NON-CONDUCTIVE SUBSTRATES                                      | 12440355        | 3/25/2009   | 8366901    | 2/5/2013   | Granted |
| MacDermid Enthone Inc. <sup>121</sup> | Method and composition for electrodeposition of copper in microelectronics with dipyriddyI-based levlers             | 12324335        | 11/26/2008  | 8388824    | 3/5/2013   | Granted |
| MacDermid Enthone Inc. <sup>122</sup> | Electrolyte Composition and Method for the Deposition of a Zinc-Nickel Alloy Layer on a Cast Iron Or Steel Substrate | 11778011        | 7/13/2007   | 8435398    | 5/7/2013   | Granted |

<sup>115</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.

<sup>116</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.

<sup>117</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.

<sup>118</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.

<sup>119</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.

<sup>120</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.

<sup>121</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.

<sup>122</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.



| Owner                                 | Title  | Application No. | Filing Date | Patent No. | Issue Date | Status  |
|---------------------------------------|--|-----------------|-------------|------------|------------|---------|
| MacDermid Enthone Inc. <sup>123</sup> | Copper electrodeposition in microelectronics   | 13/214,525      | 8/22/2011   | 8608933    | 12/17/2013 | Granted |
| MacDermid Enthone Inc. <sup>124</sup> | Anti-tarnish coatings  | 13/176,411      | 7/5/2011    | 8703243    | 4/22/2014  | Granted |
| MacDermid Enthone Inc. <sup>125</sup> | Metallie surface enhancement   | 12596559        | 2/2/2010    | 8741390    | 6/3/2014   | Granted |
| MacDermid Enthone Inc. <sup>126</sup> | Method and composition for electrodeposition of copper in microelectronics with dipyrityl-based levelers | 13/785,946      | 3/5/2013    | 8771495    | 7/8/2014   | Granted |
| MacDermid Enthone Inc. <sup>127</sup> | Cyanide free electrolyte composition for the galvanic deposition of a copper layer                       | 13054048        | 4/18/2011   | 8808525    | 8/19/2014  | Granted |
| MacDermid Enthone Inc. <sup>128</sup> | Composite coatings for whisker reduction   | 13/556,522      | 7/24/2012   | 8906217    | 12/9/2014  | Granted |
| MacDermid Enthone Inc. <sup>129</sup> | Method for the deposition of a metal layer comprising a beta-amino acid                                  | 13382131        | 3/7/2012    | 8962070    | 2/24/2015  | Granted |
| MacDermid Enthone Inc. <sup>130</sup> | Silver plating in electronics manufacture  | 13/735,779      | 1/7/2013    | 8986434    | 3/24/2015  | Granted |
| MacDermid Enthone Inc. <sup>131</sup> | CHROMIUM-FREE PICKLE FOR PLASTIC SURFACES  | 12672980        | 8/12/2010   | 9023228    | 5/5/2015   | Granted |
| MacDermid Enthone Inc. <sup>132</sup> | Adhesion promotion in printed circuit boards   | 13/431,560      | 3/27/2012   | 9040117    | 5/26/2015  | Granted |

<sup>123</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.

<sup>124</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.

<sup>125</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.

<sup>126</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.

<sup>127</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.

<sup>128</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.

<sup>129</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.

<sup>130</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.

<sup>131</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.

<sup>132</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.

| Owner                                 | Title  | Application No. | Filing Date | Patent No. | Issue Date | Status  |
|---------------------------------------|--|-----------------|-------------|------------|------------|---------|
| MacDermid Enthone Inc. <sup>133</sup> | SOLDERABILITY ENHANCEMENT BY SILVER IMMERSION PRINTED CIRCUIT BOARD MANUFACTURE                                    | 10099936        | 3/13/2002   | 9072203    | 6/30/2015  | Granted |
| MacDermid Enthone Inc. <sup>134</sup> | IMMERSION TIN SILVER PLATING IN ELECTRONICS MANUFACTURE  | 12607375        | 10/28/2009  | 9175400    | 11/3/2015  | Granted |
| MacDermid Enthone Inc. <sup>135</sup> | CYANIDE-FREE ELECTROLYTE COMPOSITION, AND METHOD FOR THE DEPOSITION OF SILVER OR SILVER ALLOY LAYERS ON SUBSTRATES | 12445049        | 10/13/2009  | 9212427    | 12/15/2015 | Granted |
| MacDermid Enthone Inc. <sup>136</sup> | ELECTROLYTIC DEPOSITION OF METAL-BASED COMPOSITE COATINGS COMPRISING NANO-PARTICLES                                | 12747681        | 7/19/2010   | 9217205    | 12/22/2015 | Granted |
| MacDermid Enthone Inc. <sup>137</sup> | Defect reduction in electrodeposited copper for semiconductor applications   | 11/971,061      | 1/8/2008    | 9222188    | 12/29/2015 | Granted |
| MacDermid Enthone Inc. <sup>138</sup> | METHOD FOR THE POST-TREATMENT OF METAL LAYERS  | 13129300        | 7/25/2011   | 9222189    | 12/29/2015 | Granted |
| MacDermid Enthone Inc. <sup>139</sup> | BETA-AMINO ACID COMPRISING PLATING FORMULATION   | 14630268        | 2/24/2015   | 9249513    | 2/2/2016   | Granted |
| MacDermid Enthone Inc. <sup>140</sup> | ADHESION PROMOTION IN PRINTED CIRCUIT BOARDS   | 13558019        | 7/25/2012   | 9338896    | 5/10/2016  | Granted |

<sup>133</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.

<sup>134</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.

<sup>135</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.

<sup>136</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.

<sup>137</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.

<sup>138</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.

<sup>139</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.

<sup>140</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.

| Owner                                 | Title   | Application No. | Filing Date | Patent No. | Issue Date | Status    |
|---------------------------------------|---|-----------------|-------------|------------|------------|-----------|
| MacDermid Enthone Inc. <sup>141</sup> | COPPER ELECTRODEPOSITION IN MICROELECTRONICS                                    | 14108954        | 12/17/2013  | 9493884    | 11/15/2016 | Granted   |
| MacDermid Enthone Inc. <sup>142</sup> | PROCESS FOR ELECTROLESS COPPER DEPOSITION ON LASER-DIRECT STRUCTURED SUBSTRATES | 14350971        | 4/10/2014   | 9538665    | 1/3/2017   | Granted   |
| MacDermid Enthone Inc. <sup>143</sup> | METHOD FOR DIRECT METALLIZATION OF NON-CONDUCTIVE SUBSTRATES                    | 13636087        | 2/4/2013    | 9617644    | 4/11/2017  | Granted   |
| MacDermid Enthone Inc. <sup>144</sup> | Cyanide-free Electrolyte Composition and Method                                 | 14962863        | 12/8/2015   | 9657402    | 5/23/2017  | Granted   |
| MacDermid Enthone Inc.                | Selective Plating of three dimensional surfaces to produce                      | 16201092        | 11/27/2018  |            |            | Pending   |
| MacDermid Enthone Inc. <sup>145</sup> | Self Assembled molecules on immersion silver coat                               | 13545030        | 7/10/2012   | 8323741    | 12/4/2012  | Granted   |
| MacDermid Enthone Inc. <sup>146</sup> | Method and Composition for electrodeposition                                    | 14325601        | 7/8/2014    | 9613858    | 4/4/2017   | Granted   |
| MacDermid Enthone Inc. <sup>147</sup> | Electroplating composition Bath [Gold]  | 09069442        | 4/29/1998   | 6576114    | 6/10/2003  | Granted   |
| MacDermid Enthone Inc.                | Etching of Plastic Using Acidic Solutions Containing Trivalent Manganese        | 15/667002       | 8/2/2017    |            |            | Published |
| MacDermid Graphics Solutions, LLC     | Printing Sleeves and Methods for Producing Same                                 | 09/744824       | 1/29/2001   | 6742453    | 6/1/2004   | Granted   |
| MacDermid Graphics Solutions, LLC     | Processless Digitally Imaged Printing Plate Using Microspheres                  | 10/105898       | 3/25/2002   | 6806018    | 10/19/2004 | Granted   |
| MacDermid Graphics Solutions, LLC     | UV Absorbing Support Layers & Flexographic Printing Elements Comprising Same    | 09/415811       | 10/11/1999  | 6413699    | 7/2/2002   | Granted   |

<sup>141</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.

<sup>142</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.

<sup>143</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.

<sup>144</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.

<sup>145</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.

<sup>146</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.

<sup>147</sup> Appropriate documentation to be filed with the USPTO to update owner name from Enthone Inc.

| Owner                             | Title   | Application No. | Filing Date | Patent No. | Issue Date | Status  |
|-----------------------------------|---|-----------------|-------------|------------|------------|---------|
| MacDermid Graphics Solutions, LLC | UV Absorbing Support Layers & Flexographic Printing Elements Comprising Same  | 10/752484       | 1/6/2004    | RE39835    | 9/11/2007  | Granted |
| MacDermid Graphics Solutions, LLC | Laser Image Printing Plates Comprising A Multi-Layer Slip Film  | 09/507840       | 2/22/2000   | 6367381    | 4/9/2002   | Granted |
| MacDermid Graphics Solutions, LLC | Printing Sleeve with an Integrated Printing Surface   | 10/754297       | 1/9/2004    | 6966259    | 11/22/2005 | Granted |
| MacDermid Graphics Solutions, LLC | Method of Preexposing Relief Image Printing Plate   | 10/853342       | 5/25/2004   | 7632625    | 12/15/2009 | Granted |
| MacDermid Graphics Solutions, LLC | Apparatus and Method for Thermally Developing Flexographic Printing Elements  | 10/891351       | 7/14/2004   | 7041432    | 5/9/2006   | Granted |
| MacDermid Graphics Solutions, LLC | Apparatus and Method for Thermally Developing Flexographic Printing Sleeves   | 10/811763       | 3/29/2004   | 6998218    | 2/14/2006  | Granted |
| MacDermid Graphics Solutions, LLC | System for Thermal Development of Flexographic Printing Plates  | 10/837107       | 4/30/2004   | 7044055    | 5/16/2006  | Granted |
| MacDermid Graphics Solutions, LLC | System for Thermal Development of Flexographic Printing Plates  | 11/297725       | 12/8/2005   | 7152529    | 12/26/2006 | Granted |
| MacDermid Graphics Solutions, LLC | Edge Cure Prevention Process  | 10/830560       | 4/23/2004   | 7055429    | 6/6/2006   | Granted |
| MacDermid Graphics Solutions, LLC | Method for Bump Exposing Relief Image Printing Plates   | 10/894979       | 7/20/2004   | 7125650    | 10/24/2006 | Granted |
| MacDermid Graphics Solutions, LLC | Edge Cure Prevention Composition and Process for Using the Same   | 10/977049       | 10/29/2004  | 7179583    | 2/20/2007  | Granted |
| MacDermid Graphics Solutions, LLC | Flexo Processor   | 11/055196       | 2/10/2005   | 7237482    | 7/3/2007   | Granted |
| MacDermid Graphics Solutions, LLC | Method for Thermally Processing Photosensitive Printing Sleeves   | 10/987624       | 11/12/2004  | 7081331    | 7/25/2006  | Granted |
| MacDermid Graphics Solutions, LLC | Method for Thermally Processing Photosensitive Printing Sleeves   | 11/439026       | 5/23/2006   | 7232649    | 6/19/2007  | Granted |
| MacDermid Graphics Solutions, LLC | Compressible Flexographic Printing Plate Construction   | 10/965315       | 10/14/2004  | 7318994    | 1/15/2008  | Granted |
| MacDermid Graphics Solutions, LLC | Compressible Flexographic Printing Plate Construction   | 11/986074       | 11/20/2007  | 8071269    | 12/6/2011  | Granted |
| MacDermid Graphics Solutions, LLC | Method and Apparatus for Applying Surface Treatments to Photosensitive Printing Elements During Thermal Development | 10/990087       | 11/16/2004  | 7247344    | 7/24/2007  | Granted |

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| Owner                             | Title   | Application No. | Filing Date | Patent No. | Issue Date | Status    |
|-----------------------------------|---|-----------------|-------------|------------|------------|-----------|
| MacDermid Graphics Solutions, LLC | Edge Cure Prevention Process  | 10/992123       | 11/18/2004  | 7060417    | 6/13/2006  | Granted   |
| MacDermid Graphics Solutions, LLC | Thermal Development System and Method of Using the Same                         | 11/159704       | 6/23/2005   | 7202008    | 4/10/2007  | Granted   |
| MacDermid Graphics Solutions, LLC | Printing Element with an Integral Printing Surface                              | 12/469721       | 5/21/2009   | 7947427    | 5/24/2011  | Granted   |
| MacDermid Graphics Solutions, LLC | Photopolymer Printing Form with Reduced Processing Time                         | 11/289814       | 11/30/2005  | 7625691    | 12/1/2009  | Granted   |
| MacDermid Graphics Solutions, LLC | Carrier Sheet for a Photosensitive Printing Element                             | 12/620715       | 11/18/2009  | 9069255    | 6/30/2015  | Granted   |
| MacDermid Graphics Solutions, LLC | Method of Creating a Digital Mask for Flexographic Printing Elements In Situ    | 12/413753       | 3/30/2009   | 8098270    | 1/17/2012  | Granted   |
| MacDermid Graphics Solutions, LLC | Method of Creating a Digital Mask for Flexographic Printing Elements In Situ    | 11/333022       | 1/17/2006   | 7531285    | 5/12/2009  | Granted   |
| MacDermid Graphics Solutions, LLC | Method of Pre-Exposing Relief Image Printing Plate                              | 11/890827       | 8/8/2007    | 7767383    | 8/3/2010   | Granted   |
| MacDermid Graphics Solutions, LLC | Method and Apparatus for Thermal Processing of Photosensitive Printing Elements | 12/183461       | 7/31/2008   | 8739701    | 6/3/2014   | Granted   |
| MacDermid Graphics Solutions, LLC | Means for Attaching a Printing Plate to a Printing Cylinder                     | 12/367650       | 2/9/2009    | 8833258    | 9/16/2014  | Granted   |
| MacDermid Graphics Solutions, LLC | Method for Improving Print Performance in Flexographic Printing Plates          | 15/638878       | 6/30/2017   |            |            | Published |
| MacDermid Graphics Solutions, LLC | Method for Improving Print Performance in Flexographic Printing Plates          | 12/660451       | 2/26/2010   | 9720326    | 8/1/2017   | Granted   |
| MacDermid Graphics Solutions, LLC | Method for Improving Print Performance in Flexographic Printing Plates          | 12/571523       | 10/1/2009   | 8158331    | 4/17/2012  | Granted   |
| MacDermid Graphics Solutions, LLC | Method for Improving Print Performance in Flexographic Printing Plates          | 13/411762       | 3/5/2012    | 8470517    | 6/25/2013  | Granted   |
| MacDermid Graphics Solutions, LLC | Method of Producing a Relief Image from a Liquid Photopolymer Resin             | 12/794238       | 6/4/2010    | 8476000    | 7/2/2013   | Granted   |
| MacDermid Graphics Solutions, LLC | Method of Improving Print Performance in Flexographic Printing Plates           | 12/984699       | 1/5/2011    | 8492074    | 7/23/2013  | Granted   |
| MacDermid Graphics Solutions, LLC | Method of Improving Print Performance in Flexographic Printing Plates           | 14/315883       | 6/26/2014   | 9298092    | 3/29/2016  | Granted   |
| MacDermid Graphics Solutions, LLC | Method of Improving Print Performance in Flexographic Printing Plates           | 12/826773       | 6/30/2010   | 8795950    | 8/5/2014   | Granted   |

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| Owner                             | Title  | Application No. | Filing Date | Patent No. | Issue Date | Status  |
|-----------------------------------|--|-----------------|-------------|------------|------------|---------|
| MacDermid Graphics Solutions, LLC | Photosensitive Resin Laminate and Thermal Processing of the Same                   | 14/136547       | 12/20/2013  | 9086630    | 7/21/2015  | Granted |
| MacDermid Graphics Solutions, LLC | Photosensitive Resin Laminate and Thermal Processing of the Same                   | 13/030810       | 2/18/2011   | 8652761    | 2/18/2014  | Granted |
| MacDermid Graphics Solutions, LLC | Slip Film for Relief Image Printing Element  | 13/169296       | 6/27/2011   | 8771926    | 7/8/2014   | Granted |
| MacDermid Graphics Solutions, LLC | Method of Controlling Surface Roughness of a Flexographic Printing Plate           | 14/081200       | 11/15/2013  | 9291891    | 3/22/2016  | Granted |
| MacDermid Graphics Solutions, LLC | Method of Controlling Surface Roughness of a Flexographic Printing Plate           | 13/182533       | 7/14/2011   | 8632958    | 1/21/2014  | Granted |
| MacDermid Graphics Solutions, LLC | Laminated Flexographic Printing Sleeves and Methods of Making the Same             | 13/205107       | 8/8/2011    | 8871431    | 10/28/2014 | Granted |
| MacDermid Graphics Solutions, LLC | Improved Laminating Apparatus and Method of Using the Same                         | 13/355769       | 1/23/2012   | 8697337    | 4/15/2014  | Granted |
| MacDermid Graphics Solutions, LLC | Photosensitive Resin Laminate and Thermal Processing of the Same                   | 14/016443       | 9/3/2013    | 9223218    | 12/29/2015 | Granted |
| MacDermid Graphics Solutions, LLC | Photosensitive Resin Laminate and Thermal Processing of the Same                   | 13/091466       | 4/21/2011   | 8551688    | 10/8/2013  | Granted |
| MacDermid Graphics Solutions, LLC | Methods for Improving Print Performance of Flexographic Printing Elements          | 13/183558       | 7/15/2011   | 8669041    | 3/11/2014  | Granted |
| MacDermid Graphics Solutions, LLC | Integrated Membrane Lamination and UV Exposure System and Method of Using the Same | 13/372060       | 2/13/2012   | 8524442    | 9/3/2013   | Granted |
| MacDermid Graphics Solutions, LLC | Method of Improving Print Performance in Flexographic Printing Plates              | 14/302512       | 6/12/2014   | 9046778    | 6/2/2015   | Granted |
| MacDermid Graphics Solutions, LLC | Method of Improving Print Performance in Flexographic Printing Plates              | 13/595473       | 8/27/2012   | 8790864    | 7/29/2014  | Granted |
| MacDermid Graphics Solutions, LLC | Clean Flexographic Printing Plate and Method of Making the Same                    | 13/409374       | 3/1/2012    | 9114601    | 8/25/2015  | Granted |
| MacDermid Graphics Solutions, LLC | Liquid Platemaking with Laser Engraving  | 13/467325       | 5/9/2012    | 9096090    | 8/4/2015   | Granted |
| MacDermid Graphics Solutions, LLC | Liquid Platemaking Process   | 13/477556       | 5/22/2012   | 8735049    | 5/27/2014  | Granted |
| MacDermid Graphics Solutions, LLC | Method of Improving Surface Cure in Digital Flexographic Printing Plates           | 14/328857       | 7/11/2014   | 9329480    | 5/3/2016   | Granted |

| Owner                             | Title   | Application No. | Filing Date | Patent No. | Issue Date | Status    |
|-----------------------------------|---|-----------------|-------------|------------|------------|-----------|
| MacDermid Graphics Solutions, LLC | Method of Improving Surface Cure in Digital Flexographic Printing Plates                    | 15/086402       | 3/31/2016   | 9751353    | 9/5/2017   | Granted   |
| MacDermid Graphics Solutions, LLC | Method of Improving Surface Cure in Digital Flexographic Printing Plates                    | 13/591375       | 8/22/2012   | 8808968    | 8/19/2014  | Granted   |
| MacDermid Graphics Solutions, LLC | Method of Improving Print Performance in Flexographic Printing Plates                       | 13/892406       | 5/13/2013   | 9040226    | 5/26/2015  | Granted   |
| MacDermid Graphics Solutions, LLC | Apparatus for Thermal Processing of Flexographic Printing Elements                          | 13/965537       | 8/13/2013   | 9649786    | 5/16/2017  | Granted   |
| MacDermid Graphics Solutions, LLC | Photosensitive Resin Composition  | 14/160799       | 1/22/2014   | 10025183   | 7/17/2018  | Granted   |
| MacDermid Graphics Solutions, LLC | Clean Flexographic Printing Plates and Method of Making the Same                            | 14/458659       | 8/13/2014   | 9217928    | 12/22/2015 | Granted   |
| MacDermid Graphics Solutions, LLC | Method for Creating Surface Texture on Flexographic Printing Elements                       | 14/183948       | 2/19/2014   | 9256129    | 2/9/2016   | Granted   |
| MacDermid Graphics Solutions, LLC | Flexographic Printing Plate with Improved Cure Efficiency                                   | 14/539171       | 11/12/2014  | 9740099    | 8/22/2017  | Granted   |
| MacDermid Graphics Solutions, LLC | Method of Making Relief Image Printing Plates   | 14/693062       | 4/22/2015   | 9703201    | 7/11/2017  | Granted   |
| MacDermid Graphics Solutions, LLC | Carrier Sheet and Method of Using the Same  | 14/830833       | 8/20/2015   | 9757919    | 9/12/2017  | Granted   |
| MacDermid Graphics Solutions, LLC | Method of Creating Hybrid Printing Dots in a Flexographic Printing Plate                    | 14/829163       | 8/18/2015   | 9678429    | 6/13/2017  | Granted   |
| MacDermid Graphics Solutions, LLC | Customizable Printing Plates and Method of Making the Same                                  | 15/040617       | 2/10/2016   | 9925757    | 3/27/2018  | Granted   |
| MacDermid Graphics Solutions, LLC | Method and Apparatus for Producing Liquid Flexographic Printing Plates                      | 15/493498       | 4/21/2017   | 10139730   | 11/27/2018 | Granted   |
| MacDermid Graphics Solutions, LLC | Method and Apparatus for Producing Liquid Flexographic Printing Plates                      | 14/935963       | 11/9/2015   | 9740103    | 8/22/2017  | Granted   |
| MacDermid Graphics Solutions, LLC | Method of Improving Light Stability of Flexographic Printing Plates Featuring Flat Top Dots | 15/067622       | 3/11/2016   | 10108087   | 10/23/2018 | Granted   |
| MacDermid Graphics Solutions, LLC | Method of Improving Light Stability of Flexographic Printing Plates Featuring Flat Top Dots | 15/485504       | 4/12/2017   |            |            | Published |
| MacDermid Graphics Solutions, LLC | Improved Method of Making a Flexographic Printing Plate                                     | 15/498844       | 4/27/2017   |            |            | Pending   |

| Owner  | Title   | Application No. | Filing Date | Patent No. | Issue Date | Status    |
|--|---|-----------------|-------------|------------|------------|-----------|
| MacDermid Graphics Solutions, LLC                | Method of Producing a Relief Image from a Liquid Photopolymer Resin   | 15/484314       | 4/11/2017   |            |            | Published |
| MacDermid Graphics Solutions, LLC                | Flexographic Printing Plate with Improved Storage Stability           | 15/590068       | 5/9/2017    |            |            | Pending   |
| MacDermid Graphics Solutions, LLC <sup>148</sup> | Laser imaged printing plates  | 09898152        | 7/3/2001    | 6916596    | 7/12/2005  | Granted   |
| MacDermid Graphics Solutions, LLC <sup>149</sup> | LASER IMAGED PRINTING PLATES  | 09921589        | 8/3/2001    | 6756181    | 6/29/2004  | Granted   |
| MacDermid Graphics Solutions, LLC <sup>150</sup> | LASER IMAGED PRINTING PLATES  | 10153946        | 5/23/2002   | 6605410    | 8/12/2003  | Granted   |
| MacDermid Graphics Solutions, LLC <sup>151</sup> | Processless digitally imaged photopolymer elements using microspheres | 10/768,799      | 1/30/2004   | 6989220    | 1/24/2006  | Granted   |
| MacDermid Graphics Solutions, LLC <sup>152</sup> | AQUEOUS DEVELOPABLE PHOTOSENSITIVE POLYURETHANE-METHACRYLATE          | 09535353        | 3/24/2000   | 6423472    | 7/23/2002  | Granted   |
| MacDermid Graphics Solutions, LLC <sup>153</sup> | COMPOSITE RELIEF IMAGE PRINTING PLATES                                | 09417043        | 10/12/1999  | 6312872    | 11/6/2001  | Granted   |
| MacDermid Graphics Solutions, LLC <sup>154</sup> | Laser Imaged Printing Plates  | 15608210        | 5/30/2017   |            |            | Pending   |
| MacDermid Graphics Solutions, LLC <sup>155</sup> | Method of Improving Print Performance in Flexographic Printing Plates | 15463379        | 3/20/2017   |            |            | Pending   |

- <sup>148</sup> Appropriate documentation to be filed with the USPTO to update owner name from MacDermid Printing Solutions, LLC
- <sup>149</sup> Appropriate documentation to be filed with the USPTO to update owner name from MacDermid Printing Solutions, LLC
- <sup>150</sup> Appropriate documentation to be filed with the USPTO to update owner name from MacDermid Printing Solutions, LLC
- <sup>151</sup> Appropriate documentation to be filed with the USPTO to update owner name from MacDermid Printing Solutions, LLC
- <sup>152</sup> Appropriate documentation to be filed with the USPTO to update owner name from MacDermid Printing Solutions, LLC
- <sup>153</sup> Appropriate documentation to be filed with the USPTO to update owner name from MacDermid Printing Solutions, LLC
- <sup>154</sup> Appropriate documentation to be filed with the USPTO to update owner name from MacDermid Printing Solutions, LLC
- <sup>155</sup> Appropriate documentation to be filed with the USPTO to update owner name from MacDermid Printing Solutions, LLC



| Owner  | Title   | Application No. | Filing Date | Patent No. | Issue Date | Status  |
|--|---|-----------------|-------------|------------|------------|---------|
| MacDermid Graphics Solutions, LLC <sup>156</sup> | Method of Improving Print Performance in Flexographic Printing Plates                       | 15463341        | 3/20/2017   |            |            | Pending |
| MacDermid Graphics Solutions, LLC <sup>157</sup> | Method of Making a Flexographic Printing Plate  | 15224979        | 8/1/2016    |            |            | Pending |
| MacDermid Graphics Solutions, LLC                | Method for Creating Surface Texture on Flexographic Printing Elements                       | 14985638        | 12/31/2015  |            |            | Pending |
| MacDermid Graphics Solutions, LLC <sup>158</sup> | Apparatus for Thermal Processing of Flexographic Printing Elements                          | 14937267        | 11/10/2015  |            |            | Pending |
| MacDermid Graphics Solutions, LLC <sup>159</sup> | Laminating Apparatus and Method of Using the Same   | 14191529        | 2/27/2014   |            |            | Pending |
| MacDermid Graphics Solutions, LLC <sup>160</sup> | Loading/Unloading System for Printing Plates  | 13653916        | 10/17/2012  |            |            | Pending |
| MacDermid Graphics Solutions, LLC <sup>161</sup> | Biodegradable Film for Flexographic Printing Plate Manufacture and Method of Using the Same | 12939388        | 11/4/2010   |            |            | Pending |
| MacDermid Graphics Solutions, LLC <sup>162</sup> | Method of Controlling Surface Roughness of a Flexographic Printing Plate                    | 12348981        | 1/6/2009    |            |            | Pending |
| MacDermid Graphics Solutions, LLC <sup>163</sup> | Apparatus and Method for Thermally Developing Flexographic Printing Elements                | 12267642        | 11/10/2008  |            |            | Pending |

- <sup>156</sup> Appropriate documentation to be filed with the USPTO to update owner name from MacDermid Printing Solutions, LLC
- <sup>157</sup> Appropriate documentation to be filed with the USPTO to update owner name from MacDermid Printing Solutions, LLC
- <sup>158</sup> Appropriate documentation to be filed with the USPTO to update owner name from MacDermid Printing Solutions, LLC
- <sup>159</sup> Appropriate documentation to be filed with the USPTO to update owner name from MacDermid Printing Solutions, LLC
- <sup>160</sup> Appropriate documentation to be filed with the USPTO to update owner name from MacDermid Printing Solutions, LLC
- <sup>161</sup> Appropriate documentation to be filed with the USPTO to update owner name from MacDermid Printing Solutions, LLC
- <sup>162</sup> Appropriate documentation to be filed with the USPTO to update owner name from MacDermid Printing Solutions, LLC
- <sup>163</sup> Appropriate documentation to be filed with the USPTO to update owner name from MacDermid Printing Solutions, LLC

| Owner  | Title  | Application No. | Filing Date | Patent No. | Issue Date | Status  |
|--|--|-----------------|-------------|------------|------------|---------|
| MacDermid Graphics Solutions, LLC <sup>164</sup> | Apparatus for thermal processing of Flexographic Printing    | 15485336        | 4/12/2017   |            |            | Pending |
| MacDermid Graphics Solutions, LLC                | SLIP FILM COMPOSITIONS CONTAINING LAYERED SILICATES          | 10946937        | 9/22/2004   | 7736836    | 6/15/2010  | Granted |
| MacDermid Graphics Solutions, LLC <sup>165</sup> | Method of Making Relief Image Printing Elements              | 15145230        | 5/3/2016    | 100336956  | 7/31/2018  | Granted |
| MacDermid Offshore Solutions, LLC                | Hydraulic Fluid Compositions                                 | 14/017786       | 9/4/2013    | 8809241    | 8/19/2014  | Granted |
| MacDermid Offshore Solutions, LLC                | Hydraulic Fluid Compositions                                 | 13/044613       | 3/10/2011   | 8563484    | 10/22/2013 | Granted |
| MacDermid Offshore Solutions, LLC                | Thermally Stable Subsea Control Hydraulic Fluid Compositions | 14/157928       | 1/17/2014   | 9458408    | 10/4/2016  | Granted |
| MacDermid Offshore Solutions, LLC                | Thermally Stable Subsea Control Hydraulic Fluid Compositions | 12/173284       | 7/15/2008   | 8759265    | 6/24/2014  | Granted |
| MacDermid Offshore Solutions, LLC                | Environmental Subsea Control Hydraulic Fluid Compositions    | 12/549579       | 8/28/2009   | 8575077    | 11/5/2013  | Granted |
| MacDermid Offshore Solutions, LLC                | Thermally Stable Subsea Control Hydraulic Fluid Compositions | 12/469337       | 5/20/2009   | 8633141    | 1/21/2014  | Granted |
| MacDermid Offshore Solutions, LLC                | Thermally Stable Subsea Control Hydraulic Fluid Compositions | 14/041669       | 9/30/2013   | 9096812    | 8/4/2015   | Granted |
| MacDermid Offshore Solutions, LLC                | Composition for Removing Scale Deposits                      | 13/475030       | 5/18/2012   | 9145508    | 9/29/2015  | Granted |
| MacDermid, Incorporated                          | Method for Enhancing the Solderability of a Surface          | 13/463087       | 5/3/2012    | RE45842    | 1/12/2016  | Granted |
| MacDermid, Incorporated                          | Method for Enhancing the Solderability of a Surface          | 13/463110       | 5/3/2012    | RE45881    | 2/9/2016   | Granted |
| MacDermid, Incorporated                          | Method for Enhancing the Solderability of a Surface          | 09/251641       | 2/17/1999   | 6200451    | 3/13/2001  | Granted |
| MacDermid, Incorporated                          | Method for Enhancing the Solderability of a Surface          | 10/341859       | 1/14/2003   | 6905587    | 6/14/2005  | Granted |
| MacDermid, Incorporated                          | Method for Enhancing the Solderability of a Surface          | 13/371848       | 2/13/2012   | RE45297    | 12/23/2014 | Granted |

<sup>164</sup> Appropriate documentation to be filed with the USPTO to update owner name from MacDermid Printing Solutions, LLC

<sup>165</sup> Appropriate documentation to be filed with the USPTO to update owner name from MacDermid Printing Solutions, LLC

| Owner   | Title   | Application No. | Filing Date | Patent No. | Issue Date | Status  |
|---|---|-----------------|-------------|------------|------------|---------|
| MacDermid, Incorporated                             | Method for Enhancing the Solderability of a Surface   | 10/456329       | 6/6/2003    | 7267259    | 9/11/2007  | Granted |
| MacDermid, Incorporated                             | Method for Enhancing the Solderability of a Surface   | 09/698370       | 10/26/2000  | 6444109    | 9/3/2002   | Granted |
| MacDermid, Incorporated                             | Method for Enhancing the Solderability of a Surface   | 09/821205       | 3/29/2001   | 6544397    | 4/8/2003   | Granted |
| MacDermid, Incorporated                             | Re-Examination of Ferrier 5,733,599 (MacDermid) METHOD FOR ENHANCING THE SOLDERABILITY OF A SURFACE | 90/012,575      | 9/14/2012   | 5733599    | 3/7/2013   | Granted |
| MacDermid, Incorporated/Chemtech Systems (co-owned) | Nickel pH Adjustment Method and Apparatus   | 12/858887       | 8/18/2010   | 8980068    | 3/17/2015  | Granted |
| Napp Systems, Inc.                                  | High Performance, Photoimageable Resin Composition & Printing Plates Prepared Therefrom             | 09/823904       | 3/30/2001   | 6579664    | 6/17/2003  | Granted |
| Napp Systems, Inc.                                  | High Performance Photoimageable Resin Composition & Printing Plates Prepared Therefrom              | 10/386315       | 3/11/2003   | 6780566    | 8/24/2004  | Granted |
| Napp Systems, Inc.                                  | Apparatus & Method For The Enhanced Imagewise Exposure of a Photosensitive Material                 | 09/382214       | 8/24/1999   | 6262825    | 7/17/2001  | Granted |
| Napp Systems, Inc.                                  | Solvent-Developable Printing Formulations with Improved Processing Characteristics                  | 09/624104       | 7/24/2000   | 6551756    | 4/22/2003  | Granted |
| Napp Systems, Inc.                                  | Highly Reflective Substrates for the Digital Imaging of Photopolymer Printing Plates                | 10/462977       | 6/16/2003   | 7005232    | 2/28/2006  | Granted |
| Napp Systems, Inc.                                  | Highly Reflective Substrates for the Digital Imaging of Photopolymer Printing Plates                | 11/267435       | 11/4/2005   | 7083896    | 8/1/2006   | Granted |
| Napp Systems, Inc.                                  | High Performance Water-Based Primer   | 10/805769       | 3/22/2004   | 7217756    | 5/15/2007  | Granted |
| Napp Systems, Inc.                                  | Apparatus for the Rapid Development of Photosensitive Printing Elements                             | 10/970881       | 10/22/2004  | 7156630    | 1/2/2007   | Granted |
| Napp Systems, Inc.                                  | Flexo Cushion   | 12/037429       | 2/26/2008   | 8943969    | 2/3/2015   | Granted |

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