

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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LG ENERGY SOLUTION, LTD.,  
SAMSUNG ELECTRONICS CO., LTD. and  
SAMSUNG ELECTRONICS AMERICA, INC.,  
Petitioner,

v.

MOLECULAR REBAR DESIGN LLC,  
Patent Owner.

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Case IPR2024-01012<sup>1</sup>  
Patent 10,608,282

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**PETITIONER'S UPDATED EXHIBIT LIST**

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<sup>1</sup> Samsung Electronics Co., Ltd. and Samsung Electronics America, Inc., which filed a petition in IPR2025-00358, have been joined as petitioners in this proceeding.

### LIST OF EXHIBITS

|           |                                                                                                                                                                                                                                                                      |
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| LGES-1001 | U.S. Patent No. 10,608,282 to Bosnyak, et al. (“the ’282 Patent”)                                                                                                                                                                                                    |
| LGES-1002 | Excerpts from the Prosecution History of the ’282 Patent (“the Prosecution History”)                                                                                                                                                                                 |
| LGES-1003 | Declaration of Dr. Sam Gido                                                                                                                                                                                                                                          |
| LGES-1004 | Curriculum Vitae of Dr. Sam Gido                                                                                                                                                                                                                                     |
| LGES-1005 | PCT Publication WO 2010/117392 (“Bosnyak-392”)                                                                                                                                                                                                                       |
| LGES-1006 | PCT Publication WO 2011/163129 (“Bosnyak-129”)                                                                                                                                                                                                                       |
| LGES-1007 | Korean Patent Publication KR 10-2010-0086854                                                                                                                                                                                                                         |
| LGES-1008 | Certified English Translation of KR 10-2010-0086854 (“Son”)                                                                                                                                                                                                          |
| LGES-1009 | “Modification of Multiwall Carbon Nanotubes by <i>Grafting from</i> Controlled Polymerization of Styrene: Effect of the Characteristics of the Nanotubes,” J. Albuerne, et al., Journal of Polymer Science Part B: Polymer Physics, 48(2020), 1035-1046 (“Albuerne”) |
| LGES-1010 | U.S. Patent Publication No. 2012/0052363 (“Fleischer”)                                                                                                                                                                                                               |
| LGES-1011 | “Cap removal and shortening of double-walled and very-thin multi-walled carbon nanotubes under mild oxidative conditions,” R. Marega, et al., <i>Carbon</i> , 47(2009), 675-682 (“Marega”)                                                                           |
| LGES-1012 | U.S. Patent Publication No. 2008/0192407 (“Lu”)                                                                                                                                                                                                                      |
| LGES-1013 | Japanese Patent Publication JP 2005-262391                                                                                                                                                                                                                           |
| LGES-1014 | Certified English Translation of JP 2005-262391 (“So”)                                                                                                                                                                                                               |
| LGES-1015 | U.S. Patent No. 9,896,341 to Noyes (“Noyes”)                                                                                                                                                                                                                         |
| LGES-1016 | “Layered and interfacially blended polyelectrolyte multi-walled                                                                                                                                                                                                      |

carbon nanotube composites for enhanced ionic conductivity,”  
X. Gu et al., *Thin Film Solids*, Vol. 520, Issue 6, (January  
2012), pp. 1872-1879 (“Gu”)

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|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| LGES-1017 | PCT Publication WO 2013/192513                                                                                                                                                                                     |
| LGES-1018 | U.S. Provisional Application No. 61/662,393                                                                                                                                                                        |
| LGES-1019 | U.S. Provisional Application No. 61/663,513                                                                                                                                                                        |
| LGES-1020 | Declaration of June Munford (Albuerne)                                                                                                                                                                             |
| LGES-1021 | RESERVED                                                                                                                                                                                                           |
| LGES-1022 | “The effect of carbon nanotube aspect ratio and loading on the elastic modulus of electrospun poly(vinyl alcohol)-carbon nanotube hybrid fibers,” K. K. H. Wong et al., <i>Carbon</i> 47 (2009) 2571-2578 (“Wong”) |
| LGES-1023 | “Dispersion State and Damage of Carbon Nanotubes and Carbon Nanofibers by Ultrasonic Dispersion: A Review,” H. Rennhofer et al., <i>Nanomaterials</i> 2021, 11, 1469 (“Rennhofer”)                                 |
| LGES-1024 | “Nanocomposites from styrene-butadiene rubber (SBR) and multiwall carbon nanotubes (MWCNT) part 1: Morphology and rheology,” S.K. Pedini et al., <i>Polymer</i> 55 (2014) 258-270 (“Peddini”)                      |
| LGES-1025 | File History of European Patent No. 2,865,031 (EP counterpart to the '282 Patent)                                                                                                                                  |
| LGES-1026 | U.S. Patent Application Publication US2009/0242850 (“Park”)                                                                                                                                                        |
| LGES-1027 | <i>Molecular Rebar Design, LLC, and Black Diamond Structures, LLC v. LG Energy Solution, Ltd.</i> , Plaintiffs’ Disclosure of Asserted Claims and Infringement, 2:24-cv-00107-JRG                                  |
| LGES-1028 | <i>Molecular Rebar Design, LLC, et al. v. LG Energy Solution, Ltd.</i> , Sample Docket Control Order, 2:24-cv-00107-JRG                                                                                            |

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| LGES-1029 | Deposition of Dr. Deborah D. L. Chung for '282 Patent.                                                                                                                                                                                        |
| LGES-1030 | Gido Supplemental Declaration                                                                                                                                                                                                                 |
| LGES-1031 | Deposition of Dr. Deborah D. L. Chung for '649 Patent (IPR2024-01005).                                                                                                                                                                        |
| LGES-1032 | Deposition Exhibit 1100 from Deposition of Dr. Deborah D. L. Chung for '649 Patent (IPR2024-01005).                                                                                                                                           |
| LGES-1033 | Deposition of Dr. Deborah D. L. Chung for '909 Patent (IPR2024-01006).                                                                                                                                                                        |
| LGES-1034 | Dictionary definition of "discrete," Webster's Dictionary (2009).                                                                                                                                                                             |
| LGES-1035 | Dictionary definition of "discrete," Merriam-Webster's Collegiate Dictionary, Eleventh Edition (2009).                                                                                                                                        |
| LGES-1036 | "Percolation and gel-like behavior of multiwalled carbon nanotube/polypropylene composites influenced by nanotube aspect ratio." Yongzheng Pan, Lin Li. Polymer, 54 (2013) 1218-1226. ("Pan")                                                 |
| LGES-1037 | "Correlations between Percolation Threshold, Dispersion State, and Aspect Ratio of Carbon Nanotubes." Jing Li, Peng-Cheng Ma, Wing Sze Chow, Chi Kai To, Ben Zhong Tang, J.-K. Kim. Advanced Functional Materials 2007, 17, 3207–3215. ("Li") |
| LGES-1038 | "The effect of the aspect ratio of carbon nanotubes on their effective reinforcement modulus in an epoxy matrix." Alfonso Martone, Gabriella Faiella, Vincenza Antonucci, Michele                                                             |

Giordano, Mauro Zarrelli. Composites Science and Technology  
71 (2011) 1117–1123. (“Martone”)

LGES-1039 “Discrete carbon nanotubes increase lead acid battery charge  
acceptance and performance.” Steven W. Swogger, Paul  
Everill, D.P. Dubey, Nanjan Sugumaran. Journal of Power  
Sources 261 (2014) 55-63. (“Swogger”)

LGES-1040 RESERVED

LGES-1041 RESERVED

LGES-1042 Patent Owner Response for ’909 Patent (IPR2024-01006)

LGES-1043 Patent Owner Response for ’924 Patent (IPR2024-01011)

LGES-1044 Patent Owner Response for ’483 Patent (IPR2024-01013)

LGES-1045 Petitioner’s Demonstratives

Respectfully submitted,

Date: September 11, 2025

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**CERTIFICATE OF SERVICE**

Pursuant to 37 CFR § 42.6(e), the undersigned certifies that on September 11, 2025, a complete and entire copy of the Petitioner's Updated Exhibit List and Exhibit 1045 were provided by email to the Patent Owner by serving the correspondence addresses of record as follows:

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