Li Zhu (Bar No. 302210)
LZhu@RobinsKaplan.com
ROBINS KAPLAN LLP
2440 W El Camino Real, Suite 100
Mountain View, CA 94040
Tel.: (650) 784-4040
Fax: (650) 784-4041

Bryan J. Vogel (*pro hac vice* to be filed)
BVogel@RobinsKaplan.com
ROBINS KAPLAN LLP
399 Park Avenue, Suite 3600
New York, NY 10022-4690
Tel.: (212) 980-7400
Fax: (212) 980-7499

Cyrus A. Morton (*pro hac vice* to be filed)
CMorton@RobinsKaplan.com
William E. Manske (*pro hac vice* to be filed)
WManske@RobinsKaplan.com
Emily J. Tremblay (*pro hac vice* to be filed)
ETremblay@RobinsKaplan.com
ROBINS KAPLAN LLP
800 LaSalle Avenue, Suite 2800
Minneapolis, MN 55402
Tel.: (612) 349-8500
Fax: (612) 339-4181

Attorneys for Plaintiff
Celgard, LLC

UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF CALIFORNIA

Celgard, LLC,

Plaintiff,

v.

MTI Corporation,

Defendant.

Case No. _____

DEMAND FOR JURY TRIAL

COMPLAINT FOR PATENT INFRINGEMENT

Plaintiff Celgard, LLC ("Celgard"), by way of its Complaint for Patent Infringement

("Complaint") against Defendant MTI Corporation ("MTI" or "Defendant"), alleges as follows:

NATURE OF THE ACTION

1. This is an action for patent infringement of United States Patent No. 6,432,586 ("the '586 patent"), entitled "Separator for a High Energy Rechargeable Lithium Battery," under the Patent Laws of the United States, 35 U.S.C. § 1, *et seq.*, and seeking damages, injunctive relief, and other relief as appropriate under 35 U.S.C. § 281, *et seq*. A true and correct copy of the '586 patent is attached hereto as **Exhibit A**.

THE PARTIES

2. Celgard is a limited liability company organized and existing under the laws of Delaware, with its principal place of business located in Charlotte, North Carolina. Celgard is directly owned by Polypore International, LP, which is headquartered in Charlotte, North Carolina and is indirectly owned by Asahi Kasei Corporation, which is headquartered in Japan.

3. Celgard is a global leader in the development and production of specialty microporous membranes, including separators used in lithium-ion batteries for consumer electronic devices and electric vehicles. Celgard's leading market position is attributable, in part, to its development, maintenance, and enforcement of its intellectual property, including the '586 patent. Indeed, in presentations to customers, potential customers, and industry audiences, Celgard frequently lists the '586 patent as a major part of its success in the ceramic coated separator market.

4. MTI is a corporation organized and existing under the laws of California, with its principal place of business in Richmond, California. MTI is engaged in the business of developing, offering to sell, and selling its products to companies and institutions throughout the United States, including the State of California. MTI competes with Celgard in the battery separator market. Certain unauthorized and counterfeit so-called "Celgard" products are available for purchase on MTI's website. And, as detailed below, MTI sells certain ceramic coated separator products that directly infringe the '586 patent.

JURISDICTION AND VENUE

5. This Court has subject matter jurisdiction over this action pursuant to 28 U.S.C.

§§ 1331 and 1338(a) because this action arises under the Patent Laws of the United States, 35 U.S.C. §§ 271 and 281-285.

6. Venue is proper in this judicial district under 28 U.S.C. §§ 1391(b) and (c) and/or 1400(b) because MTI is incorporated in the State of California and thus "resides" in the State of California.

7. Personal jurisdiction over MTI is proper because MTI is domiciled in California, has substantial business in California, and has purposefully availed itself of the rights and privileges of conducting business in California.

8. MTI has infringed and/or continues to infringe the '586 patent, identified below, in this judicial district.

TECHNOLOGY BACKGROUND

9. Lithium batteries are typically constructed with a thin porous insulating film (the separator) that allows the battery to operate but prevents the electrodes (cathode and anode) from contacting each other. When the battery is discharged, positively charged lithium ions flow from the anode, through the separator, to the cathode. This process leaves a negative charge of electrons on the anode. When charging, the flow is reversed. In a rechargeable (secondary) lithium battery, the charge and discharge states are repeated during use. The process of charging and discharging the battery is referred to as one cycle.

10. Lithium batteries present certain unique safety challenges due to their chemical design and composition. One such challenge is lithium dendrite growth—the irregular growth of a metal on an electrode during charging or discharging. Over repetitive charge-discharge cycles, dendrites may grow out from the electrode's surface in a needle-like structure. And as the battery is cycled further, the dendrite may continue to grow, penetrating the separator and making direct, physical contact with the opposite electrode. When such contact is made, an electrical short circuit of the battery may occur. This may cause the battery to malfunction. In certain scenarios, it may cause the battery's internal temperature to rise quickly and uncontrollably, leading to thermal runaway and catastrophic failure.

11. The battery industry has long identified dendrite growth and associated electronic

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shorting as a significant safety issue. Prior to the invention disclosed in the '586 patent, however, solutions to the problem were varied and achieved mixed results.

12. In at least 2000, Celgard research scientist Dr. Zhengming Zhang invented the separator technology described and claimed in the '586 patent to address safety and durability problems in lithium batteries. Dr. Zhang's separator has (1) a ceramic composite layer (or coating) including a mixture of inorganic particles and a matrix material, and (2) a polyolefinic microporous layer. The claimed separator's ceramic composite layer combines inorganic particles within a matrix material to create a composite layer adapted to at least block dendrite growth and prevent electrical shorts, improving the safety and commercialization of high energy lithium batteries. The claimed separator's polyolefinic microporous layer is adapted to block ionic flow between the anode and cathode. This shutdown functionality further improves battery safety.

13. Today, ceramic coated separators are increasingly common in the rechargeable (often large format) lithium batteries used in electric vehicles and for other high-power applications. Much of the plug-in electric vehicle market in the U.S. has adopted ceramic coated separator technology. And as the electric vehicle market continues to grow, an increasing percentage of manufacturers have turned to ceramic coated separators as a means to improve battery safety, battery cycle life, and vehicle driving range.

U.S. PATENT NO. 6,432,586

14. Celgard is the owner by assignment of all right, title, and interest in and to the '586 patent, including the right to sue for past damages and injunctive relief. The '586 patent was duly and legally issued by the United States Patent and Trademark Office on August 13, 2002, and is active as to Claim 12.

15. On information and belief, Celgard's enforcement of the '586 patent against infringing parties is well known within the battery and battery materials industry.

16. In 2013, Celgard filed suit against Sumitomo Chemical Co., Ltd. ("Sumitomo") in the United States District Court for the Western District of North Carolina for infringement of the '586 patent. The suit was resolved pursuant to agreement of the parties. The suit and its resolution were subject to national, industry-focused media coverage as shown in **Exhibit B** attached hereto.

17. In 2014, Celgard filed a patent infringement suit against LG Chem Ltd. and LG Chem America, Inc. (collectively, "LG Chem") in the United States District Court for the Western District of North Carolina for infringement of the '586 patent. The suit was resolved pursuant to agreement of the parties after significant district court litigation and patent office proceedings. The suit and its resolution were subject to national, industry-focused media coverage as shown in **Exhibit C** attached hereto.

18. In 2014, Celgard filed suit against SK Innovation Co., Ltd. ("SK Innovation") in the United States District Court for the Western District of North Carolina for infringement of the '586 patent. The suit was resolved pursuant to agreement of the parties after significant district court litigation and patent office proceedings. The suit and its resolution were subject to national, industry-focused media coverage as shown in **Exhibit D** attached hereto.

19. The validity of Claim 12 of the '586 patent was challenged by both LG Chem and SK Innovation. The Patent Trial and Appeal Board (PTAB) rejected all challenges to Claim 12, which remains valid and enforceable.

MTI'S INFRINGING CONDUCT

20. MTI represents itself as a supplier of materials and laboratory equipment. MTI purports to be a "leading manufacturer of oxide crystals, substrates and lab equipment for material research." MTI states that its customers include universities, national laboratories, and company "R&D group[s]."

21. On information and belief, MTI is aware of Celgard and its products, including Celgard's separator products. MTI offers for sale lithium ion "battery separator film," which it represents as being "made by Celgard." This "battery separator film" product is available for sale via MTI's website as shown below:

[INTENTIONALLY BLANK]

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Li-ion Battery Separator Film (25um thick x 85mm W x 60m L, Celgard) - EQ-bsf-0025-60C

Sale Price: USD$105.00
If you are international, please click this.

In stock
Item Number: EQ-bsf-0025-60C

Quantity: 1 BUY

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Quantity Discounts

Quantity	Amount
5 to 9	USD$99.75
10 to 19	USD$94.50
20 or more	USD$89.25

This separator is a 25um Trilayer polypropylene-polyethylene-polypropylene membran. It is made by Celgard. can be used as li-ion battery separator in bat

A true and correct copy of a printout from MTI's website showing the availability of so-called "Celgard" products on MTI's website and dated December 11, 2018, is attached hereto as **Exhibit E**.

22. MTI also offers for sale a "polyethylene membrane" with "double side ceramic (Alumina) coating" as a separator for a lithium-ion battery. This product is available for sale via MTI's website as shown below:

Ceramic Coated Membrane (16um thick x 60mm W x 500m L) as Separator of Li-ion Battery - EQ-bsf-0016-500A

Sale Price: USD$498.00
If you are international, please click this.

In stock
Item Number: EQ-bsf-0016-500A

Quantity: 1 BUY

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Quantity Discounts

Quantity	Amount
2 to 5	USD$473.10
6 to 9	USD$448.20
10 or more	USD$423.30

A true and correct copy of a printout from MTI's website showing the availability of this ceramic coated separator product on MTI's website and dated December 11, 2018, is attached hereto as **Exhibit F**. As shown therein, MTI represents that its ceramic coated separator "not only increases the mechanical properties and thermal stability of the separator in battery operation, but more importantly, it prevents dendrite growth and enhance[s] SEI layer forming." MTI also represents that its ceramic coated separator "is designed to improve the safety of large-format lithium-ion

batteries used in electric vehicles and high-power applications."

23. MTI's ceramic coated separator infringes Claim 12 of the '586 patent. Claim 12 of the '586 patent reads as follows:

> A separator for an energy storage system comprises:
>
> at least one ceramic composite layer or coating, said layer including a mixture of 20-95% by weight of inorganic particles selected from the group consisting of SiO_2, Al_2O_3, $CaCO_3$, TiO_2, SiS_2, $SiPO_4$, and mixtures thereof, and 5-80% by weight of a matrix material selected from the group consisting of polyethylene oxide, polyvinylidene fluoride, polytetrafluoroethylene, copolymers of the foregoing, and mixtures thereof, said layer being adapted to at least block dendrite growth and to prevent electronic shorting; and
>
> at least one polyolefinic microporous layer having a porosity in the range of 20-80%, an average pore size in the range of 0.02 to 2 microns, and a Gurley Number in the range of 15 to 150 sec, said layer being adapted to block ionic flow between an anode and a cathode.

24. The above-identified MTI ceramic coated separator features a ceramic composite layer or coating composed of inorganic particles of the nature and weight percentage (or the equivalent thereto) set forth in Claim 12 of the '586 patent. MTI represents its ceramic coated separator product as having a "double side ceramic (Alumina) [(Al_2O_3)] coating."

25. The above-identified MTI ceramic coated separator features a ceramic composite layer or coating composed of a matrix material of the nature and weight percentage (or the equivalent thereto) set forth in Claim 12 of the '586 patent.

26. The above-identified MTI ceramic coated separator features a ceramic composite layer that is "adapted to at least block dendrite growth and prevent electronic shorting," as set forth in Claim 12 of the '586 patent. As shown in **Exhibit F**, MTI represents that its ceramic coated separator "prevents dendrite growth and enhance[s] SEI layer forming."

27. The above-identified MTI ceramic coated separator features a polyolefinic microporous layer having porosity, average pore size, and Gurley Number measurements within the ranges (or the equivalents thereto) set forth in Claim 12 of the '586 patent.

28. The above-identified MTI ceramic coated separator features a polyolefinic microporous layer that is "adapted to block ionic flow between an anode and a cathode," as set

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forth in Claim 12 of the ’586 patent.

FIRST CLAIM FOR RELIEF

Infringement of the ’586 patent

29. Celgard realleges each and every allegation set forth in Paragraphs 1 through 28 and incorporates them here by reference.

30. Celgard is the owner by assignment of all rights, title, and interest in and to the ’586 patent.

31. Claim 12 of the ’586 patent is valid and enforceable.

32. Upon information and belief, and in violation of 35 U.S.C. § 271(a), MTI has infringed and continues to directly infringe Claim 12 of the ’586 patent by making, using, offering for sale, selling, and/or importing in the United States a ceramic coated separator covered by Claim 12 of the ’586 patent, including at least MTI’s ceramic coated separator identified above.

33. MTI has had actual knowledge of the ’586 patent at least as of the filing of this Complaint. MTI’s continued infringement on or after this date is in spite of the objectively high likelihood that its activities constitute infringement of a valid patent, and this risk was either known or so obvious that it should have been known to MTI. Thus, MTI’s continued infringement at least as of the filing of this Complaint is willful and deliberate.

34. On information and belief, a reasonable opportunity for further investigation or discovery will show that MTI had actual knowledge of the ’586 patent before the filing of this Complaint and continued its infringement in spite of the objectively high likelihood that its activities constituted infringement of a valid patent. Celgard’s ownership and previous enforcement of the ’586 patent is well known in the battery and battery materials industry. Further, Celgard and MTI are competitors in the battery separator market. And MTI sells certain unauthorized and counterfeit so-called “Celgard” separator products through its website as discussed above and shown in **Exhibits E & F**, evidencing MTI’s direct knowledge of Celgard and Celgard’s separator products.

35. Celgard has suffered and continues to suffer damages and irreparable harm as a

result of MTI's past and ongoing infringement. Unless and until MTI's infringement is enjoined, Celgard will continue to be damaged and irreparably harmed.

36. Celgard is entitled to all remedies at law and equity, including, but not limited to, an injunction against MTI's infringement of the '586 patent pursuant to 35 U.S.C. § 283.

37. Celgard is entitled to damages for MTI's infringement of the '586 patent, including, but not limited to, damages pursuant to 35 U.S.C. §§ 284, 285.

JURY DEMAND

Celgard hereby requests a trial by jury pursuant to Rule 38 of the Federal Rules of Civil Procedure.

REQUEST FOR RELIEF

Celgard respectfully asks that the Court enter judgment in its favor as follows:

A. Finding that MTI has infringed and is infringing the '586 patent;

B. Finding that MTI's infringement of the '586 patent has been and continues to be willful;

C. Awarding Celgard damages adequate to compensate it for MTI's past and present infringement, but in no event less than a reasonable royalty;

D. Awarding an accounting and supplemental damages for those acts of infringement committed by MTI subsequent to the discovery cut-off date in this action through the date Final Judgment is entered;

E. Ordering that damages for infringement of the '586 patent be trebled as provided for by 35 U.S.C. § 284 for MTI's willful infringement of the '586 patent;

F. Finding that this case is exceptional;

G. Awarding Celgard its attorneys' fees and costs, together with prejudgment and post-judgment interest;

H. Preliminarily and permanently enjoining MTI and its parents, subsidiaries, affiliates, officers, directors, agents, servants, employees, successors and assigns, and all others in active concert or participation with any of the foregoing from any further acts of infringement, including contributing to and/or inducing infringement, of the '586

patent; and

I. Any further relief that this Court deems just and proper.

DATED: December 11, 2018

Respectfully submitted,

/s/ Li Zhu

Li Zhu (Bar No. 302210)
LZhu@RobinsKaplan.com
ROBINS KAPLAN LLP
2440 W El Camino Real, Suite 100
Mountain View, CA 94040
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Minneapolis, MN 55402
(612) 349-8500

ATTORNEYS FOR PLAINTIFF CELGARD, LLC