

THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF NEW YORK

VEECO INSTRUMENTS INC.	)	
	)	
Plaintiff,	)	
	)	
v.	)	
	)	Civil Action No. 1:17cv2217 (PKC)
SGL CARBON, LLC, and	)	
SGL CARBON SE	)	<u>DEMAND FOR JURY TRIAL</u>
	)	
Defendants.	)	
	)	
	)	

FIRST AMENDED COMPLAINT¹

Pursuant to leave granted during the July 18, 2017 hearing, Plaintiff Veeco Instruments Inc. (“Veeco” or “Plaintiff”), by its undersigned attorneys, for its first amended complaint against Defendants SGL Carbon, LLC and SGL Carbon SE (collectively, “SGL” or “Defendants”), alleges as follows:

PRELIMINARY STATEMENT

1. This is an action brought by Veeco, the market leader in Metal-Organic Chemical Vapor Deposition (“MOCVD”) reactors and other systems for the manufacture of electronic components, against SGL, Plaintiff’s supplier and manufacturer of carbon based products,

¹ To streamline the issues before the Court and avoid unnecessary motion practice, and based on representations made by SGL’s counsel during the July 18, 2017 hearing, in this First Amended Complaint, Veeco has withdrawn, without prejudice to re-filing, (1) its infringement allegations relating to two of the patents included in its April 12, 2017 Complaint: U.S. Patent Nos. 6,685,774 and D690,671; and (2) its direct infringement allegations under 35 U.S.C. § 271(a) relating to U.S. Patent No. 6,506,252. Veeco expressly reserves all rights and remedies relating to these claims and patents.

arising out of SGL's infringing manufacture, use, and sale of removable wafer carriers mounted on a spindle for use in non-Veeco MOCVD reactors.

2. Veeco's primary business is in selling and servicing process equipment solutions that enable the manufacture of Light-Emitting Diodes (LEDs), power electronics, hard drives, Micro-Electro-Mechanical Systems (MEMS), advanced displays, photonics, and wireless chips. Veeco is the market leader in MOCVD reactors, Molecular Beam Epitaxy (MBE) systems, Ion Beam and other advanced thin film process technologies.

3. Since 2003, Veeco has been a pioneer in the field of MOCVD reactors, having invented (or acquired) numerous groundbreaking technologies that have enhanced the productivity, efficiency, and speed of the production of LEDs. For example, Veeco's newest generation of MOCVD reactors, the award winning TurboDisc EPIK® 700 MOCVD system, has the highest productivity of any MOCVD system currently in the industry.

4. Veeco possesses numerous patents directed to the manufacture, design, and use of removable wafer carrier technology, including without limitation: U.S. Patent No. 6,726,769 (the "'769 Patent") and U.S. Patent No. 6,506,252 (the "'252 Patent") (collectively, the "Asserted Patents").

5. Between 2003 and 2016, Veeco invested over \$475 million in R&D and IP acquisitions to develop its MOCVD technology, and further spent millions more on sales, advertising, personnel, and infrastructure for its MOCVD products. As a result, Veeco substantially increased its global revenue for its MOCVD products from \$3.6 million in 2003 to over \$140 million in 2016, with cumulative global revenues for its MOCVD products of over \$3 billion from 2003 to 2016. Veeco designs, manufactures, sells, and services, among other things,

MOCVD systems for the production of LEDs. Veeco sells such systems to customers that use the systems to manufacture LEDs. One key differentiating component of Veeco's MOCVD systems for LED production is the removable wafer carrier that is detachably mounted on a spindle centrally positioned within the MOCVD reactor. A wafer is typically a thin slice of substrate material, such as silicon or sapphire, which is used in electronics as a base for circuit fabrication. These wafers are the foundation upon which nearly all modern semiconductor devices are built. As part of the method for fabricating various types of semiconductors, such as LEDs, wafers are placed into a MOCVD reactor for processing. The wafer carrier in a MOCVD reactor must hold wafers in place while the reactor processes the wafers. Veeco's patented removable wafer carrier was a groundbreaking innovation that greatly improved the efficiency and performance of Veeco's MOCVD reactors. The design of Veeco's removable wafer carriers for use in its MOCVD reactors gives Veeco a competitive advantage over its competitors by increasing throughput and reducing cost of ownership and is a key driver of demand and goodwill for Veeco's products.

6. Since 2011, Veeco and SGL have entered into a series of agreements and amendments thereto (collectively, the "Agreements") whereby Veeco disclosed its patented and/or proprietary technology to SGL for the purpose of allowing SGL to supply Veeco and/or Veeco's customers with removable wafer carriers. In exchange, SGL agreed to provide Veeco and Veeco's customers with critically important components for incorporation into Veeco's products, namely, removable wafer carriers for use in Veeco's MOCVD reactors. After entering into these Agreements, SGL—without authorization under the Agreements—began selling and offering for sale infringing removable wafer carriers (the "Infringing Products") to Veeco's

competitors, including Advanced Micro-Fabrication Equipment, Inc. (“AMEC”) and AMEC’s customers, without permission or consent from Veeco. Veeco brings this action seeking relief against SGL’s willful infringement of Veeco’s patents in the United States.

PARTIES

7. Plaintiff Veeco Instruments Inc. is a Delaware corporation with its global headquarters and principal place of business located at 1 Terminal Drive, Plainview, NY 11803.

8. Defendant SGL Carbon SE is a German corporation with its global headquarters and principal place of business at Söhnleinstraße 8, 65201 Wiesbaden, Germany.

9. Defendant SGL Carbon, LLC is a wholly owned subsidiary of SGL Carbon Beteiligung GmbH, which is a wholly owned subsidiary of SGL Carbon SE. SGL Carbon, LLC functions as the North American subsidiary of Defendant SGL Carbon SE. SGL Carbon, LLC is a domestic limited liability company organized under the laws of Nevada, with its headquarters and principal place of business at 10130 Perimeter Parkway, Suite 500, Charlotte, NC, 28216.

10. Upon information and belief, Defendant SGL Carbon SE directs and controls the activities of its subsidiaries, including Defendant SGL Carbon, LLC. For example, Defendant SGL Carbon, LLC does not appear to maintain a separate website from Defendant SGL Carbon SE. In its Annual Report, SGL Carbon SE does not report or break out costs, sales, expenses, or employment of SGL Carbon, LLC separately. SGL Group, Annual Report Twenty Sixteen, *available at* https://www.sglgroup.com/cms/_common/downloads/investor-relations/financial-reports/business-reports/2016-en/annual_16_e.pdf (last visited July 19, 2017). Furthermore, according to the corporate structure of Defendant SGL Carbon SE, SGL Carbon SE’s Board of Management provides the overall strategic direction for the company, and the Management

Committees of the Global Business units of SGL Carbon SE are responsible for developing and executing the strategic and operating plans for its subsidiaries, including SGL Carbon, LLC. See “Corporate Structure of SGL Group,” SGL CARBON, http://www.sglgroup.com/cms/international/company/corporate-structure/index.html?__locale=en (last visited July 19, 2017). SGL Carbon SE’s own materials hold out SGL Carbon LLC as the subsidiary through which it conducts business in the Americas. SGL Group, “Specialty Graphites for the Semiconductor Industry,” at *20, https://www.sglgroup.com/cms/_common/downloads/products/product-groups/gb/brochures/Specialty_Graphites_for_the_Semiconductor_Industry_e.pdf (last visited July 19, 2017) (hereinafter “SGL Carrier Brochure”). Furthermore, Scott Carlton, president of SGL Carbon, LLC and signatory on at least one of the agreements between SGL and Veeco for wafer carriers, represented himself as a “managing agent” of SGL Carbon SE. (Dkt. No. 14 at *1 (Affidavit of Service)).

11. Upon information and belief, SGL operates dozens of production facilities around the world, including facilities that manufacture the Infringing Products for sale in the United States and globally to Veeco’s competitors—including but not limited to AMEC—and Veeco’s competitors’ customers—including but not limited to AMEC’s customers Sanan and HC Semitek.

JURISDICTION AND VENUE

12. This is an action for patent infringement arising under the patent laws of the United States, Title 35 of the United States Code. This Court has subject matter jurisdiction pursuant to 28 U.S.C. §§ 1331 and 1338(a).

13. This court has personal jurisdiction over Defendants by virtue of the governing

law and forum selection clauses in the executed Agreements between Plaintiff and Defendants. The forum selection clause is sufficient to provide this Court with personal jurisdiction over the Defendants under New York law.

14. Additionally, SGL regularly conducts business throughout the United States, including in this district. Upon information and belief, SGL advertises for sale the Infringing Products in this district through its publicly available websites, which are available to and accessible by customers in this judicial district.

15. This Court further has personal jurisdiction over Defendants by virtue of their presence and regular business activities within this judicial district, including, upon information and belief, advertising and/or sales of the Infringing Products to customers in New York.

16. Venue is proper in this judicial district by virtue of the forum selection clauses in the executed Agreements between Plaintiff and Defendants.

17. Venue is also proper in this judicial district under 28 U.S.C. §§ 1391(b), 1391(c), and 1400(b), for the reasons described above.

JOINDER

18. Upon information and belief, the right to relief asserted against Defendants in this Complaint arises out of the same transaction, occurrence, or series of transactions or occurrences relating to the making, using, selling, offering for sale, and/or importing in the United States products and/or services that incorporate or make use of one or more of the inventions covered by the Asserted Patents. Therefore, questions of fact common to all Defendants will arise in this action and joinder of the Defendants under 35 U.S.C. § 299 is proper.

THE ASSERTED PATENTS

19. On April 27, 2004, the USPTO duly and legally issued U.S. Patent No. 6,726,769 (the “’769 Patent”), entitled “SUSCEPTORLESS REACTOR FOR GROWING EPITAXIAL LAYERS ON WAFERS BY CHEMICAL VAPOR DEPOSITION.” Veeco is the owner by assignment of all right, title, and interest in and to the ’769 patent, including without limitation the right to sue and recover for past, current, and future infringement thereof. A true and correct copy of the ’769 Patent is attached as Exhibit A.

20. On January 14, 2003, the United States Patent and Trademark Office (the “USPTO”) duly and legally issued U.S. Patent No. 6,506,252 (the “’252 Patent”), entitled “SUSCEPTORLESS REACTOR FOR GROWING EPITAXIAL LAYERS ON WAFERS BY CHEMICAL VAPOR DEPOSITION.” Veeco is the owner by assignment of all right, title, and interest in and to the ’252 patent, including without limitation the right to sue and recover for past, current, and future infringement thereof. A true and correct copy of the ’252 Patent is attached as Exhibit B.

FACTUAL ALLEGATIONS

Plaintiff and its MOCVD technology

21. Veeco is a Delaware corporation, founded in 1989, which traces its roots back to a company founded in this district in 1945 by two former Manhattan Project scientists, Frank Raible and Al Nerken, at the time specializing in the development of high performance gas leak detection and electronic equipment. Since then, Veeco has become a pioneer in supplying process equipment for information age industries.

22. In 2003, in order to enter the field of MOCVD equipment for LED production,

Veeco began obtaining patents for MOCVD reactor technology, including by acquisition of Emcore Corporation's TurboDisc MOCVD division. By July 2004, Veeco's MOCVD reactors accounted for \$42.4 million in revenue for the company.

23. MOCVD is a method by which semiconductor wafers are processed for fabrication of electrical circuits. Multiple wafers are placed on a wafer carrier within a MOCVD reactor. Once wafers are placed into the reactor, controlled quantities of gases at controlled rates are applied to the wafers as they are being heated and rotated, such that thin layers of components are deposited on the surface of the wafers. These atoms form layers from which semiconductor circuits are fabricated. LEDs are one type of circuit created using MOCVD methods.

24. One important aspect of Veeco's MOCVD reactor is the removable wafer carrier. The removable wafer carriers, which can be mounted on a spindle, can further be used to transport wafers through successive processes. Wafers can be loaded and unloaded on the removable wafer carrier while the MOCVD reactor remains in operation with another wafer carrier. Furthermore, the wafer carriers can be cleaned readily. The improved design of Veeco's removable wafer carriers resulted in significant cost-saving efficiencies that were, and are, unmatched in the industry, and were a significant improvement over then-existing technology. Veeco obtained the Asserted Patents to protect key aspects of its removable wafer carrier technology.

25. The CEO and Chairman of Veeco, John Peeler, foreseeing the need for high performance LEDs, positioned Veeco to become a market leader in the development of LEDs by further developing and improving its MOCVD systems, including by investing over \$400 million

in R&D for its MOCVD systems. Veeco's revenue increased from approximately \$100 million in 2007 to over \$330 million in 2016. A significant portion—over 40%—of Veeco's revenue is attributed to its industry leading MOCVD systems for efficiently and quickly producing high performance LED circuits.

26. In order to meet the increasing demand for Veeco's MOCVD systems, Veeco relies on third party suppliers to manufacture key components for its MOCVD systems. Veeco has entered into various agreements with multiple suppliers in order to manufacture key components such as its removable wafer carriers.

Veeco-SGL Agreements

27. In 2006, Veeco and SGL entered into discussions regarding SGL becoming a supplier of key components for Veeco's MOCVD systems. SGL, as a manufacturer of carbon and graphite products, was capable of manufacturing graphite removable wafer carriers that were based on Veeco's designs and specification and that could meet the demands of Veeco's MOCVD systems. Veeco and SGL began working together.

28. On April 30, 2011, Veeco and SGL executed an agreement entitled Requirements for Suppliers to Veeco's Key Contract Manufacturers ("Key Supplier Agreement"), whereby SGL was licensed to utilize Veeco's proprietary technology (including Veeco's patents) to manufacture removable wafer carriers solely for Veeco and Veeco's customers. A series of other agreements were subsequently executed to further define the business relationship between the parties. (Collectively with the Key Supplier Agreement, these agreements are referred to herein as the "Agreements.")

29. In furtherance of the Agreements, Veeco provided SGL with diagrams, drawings,

specifications, and other proprietary information regarding its removable wafer carrier technology. SGL began to supply Veeco and its customers with removable wafer carriers pursuant to the Agreements.

Defendants' Infringing Conduct

30. SGL in the United States advertises for sale removable wafer carriers for MOCVD reactors, including the Infringing Products.

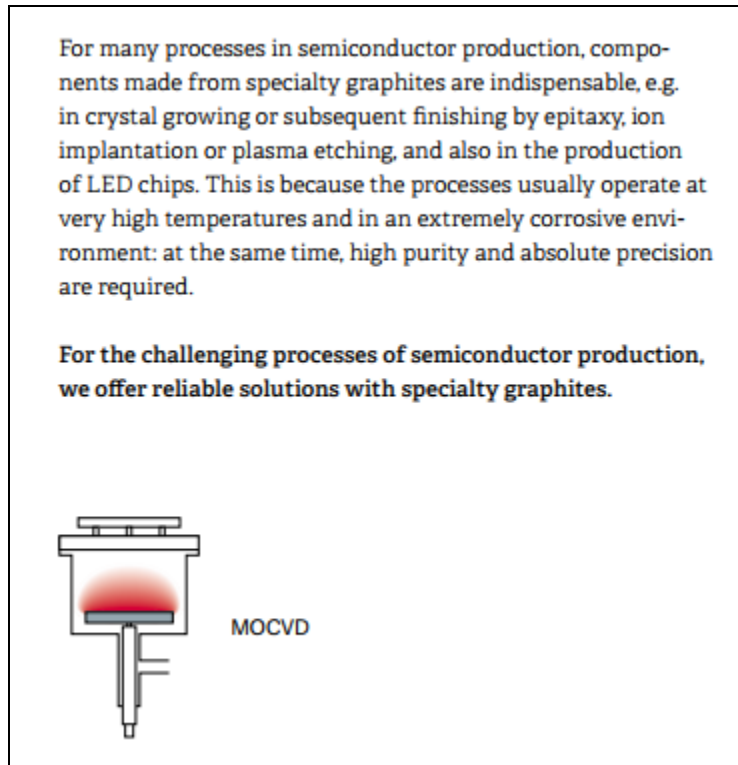
31. For example, SGL advertises a wafer carrier “for LED chip production in MOCVD reactors” on its website:



SGL Group, Website, Products for LED chip production in MOCVD reactors: *Susceptors/carriers, lids rings, and satellites*, (available online at: <https://www.sglgroup.com/cms/>)

international/products/product-groups/fgg/specialty-graphites-for-the-semiconductor-and-led-industries/LED-chip-production.html?__locale=en (last visited July 19, 2017) (“SGL Website”).

32. SGL further describes the use for its Infringing Products in its publicly available product brochure:



SGL Group, Product Brochure, *Specialty Graphites for the Semiconductor Industry* (available online at http://www.sglgroup.com/cms/_common/downloads/products/product-groups/gs/brochures/Specialty_Graphites_for_the_Semiconductor_Industry_e.pdf) (last visited July 20, 2017) (“SGL Carrier Brochure”).

33. SGL’s advertising materials describe specific features of the Infringing Products that are covered by Veeco’s patented technology, including how “the substrate wafers are supported by rotating susceptors or carriers,” the use of “isostatic graphite” for the wafer carriers, and the “specially selected graphite grades for our susceptors and carriers.” SGL Carrier

Brochure at 10.

34. Upon information and belief, SGL, without authorization, makes, uses, tests, sells, offers for sale, imports and/or exports the Infringing Products in the United States in violation of the U.S. patent laws and Veeco's patent rights.

35. In early 2017, prior to filing this complaint, Veeco informed SGL both at in person meetings and by letter that SGL was infringing Veeco's patents, by, *e.g.*, selling infringing wafer carriers to AMEC and AMEC's customers without authorization from Veeco. Veeco requested that SGL cease such infringing conduct and sales, but SGL has not provided assurances that it will to do so. As recently as June 21, 2017, SGL confirmed that it supplies graphite wafer carrier components to AMEC that are manufactured to AMEC's specifications. (Dkt. No. 12 at 1.) The Infringing Products are specially designed to be compatible with AMEC's MOCVD system, the Prismo D-Blue. Upon information and belief, AMEC's MOCVD system design mirrors that in AMEC's published patent application, U.S. Patent Application No. 13/681,768 (AMEC's '768 Application), entitled "Chemical Vapor Deposition or Epitaxial-Layer Growth Reactor and Supporter Thereof." A copy of AMEC's '768 Application is attached as Exhibit C. Regardless of whether SGL is manufacturing wafer carriers to AMEC's specifications, the manufacture, sale, offer for sale, use, exportation, and importation of such wafer carriers, without Veeco's authorization, is an infringement.

36. SGL's infringement of the Asserted Patents has caused damage to Plaintiff, including lost royalties, lost sales, and/or lost profits. SGL's infringement is further causing irreparable harm to the Plaintiff in the form of lost customers, lost market share, and/or price erosion relating to its MOCVD systems. SGL's infringing actions will continue unless enjoined

by this Court.

37. Upon information and belief, SGL had actual knowledge of the Asserted Patents prior to the filing of this complaint based on its familiarity with Veeco and Veeco's patent portfolio relating to wafer carriers, and further knew that manufacturing and/or selling the wafer carriers outside the terms of the Agreements would infringe Veeco's patents.

38. Veeco notified SGL that manufacturing the wafer carriers for sale to AMEC or AMEC's customers would infringe Veeco's patent portfolio at least as early as January 31, 2017, when executives from Veeco and SGL met in person to discuss IP concerns surrounding the wafer carriers. Veeco informed SGL of its concern regarding IP violations relating to the wafer carrier technology, that Veeco takes its intellectual property rights very seriously, and that Veeco will defend these rights. Veeco, in those communications with SGL, further described the technological aspects of those wafer carriers that are protected by Veeco's extensive worldwide patent portfolio. SGL and Veeco further discussed licensing and royalty agreements regarding the wafer carriers that SGL would manufacture for Veeco and Veeco's customers. At this meeting, SGL verbally agreed to respect Veeco's patents and other intellectual property but SGL continues its infringing conduct through at least manufacturing and selling Infringing Products to AMEC and AMEC's customers.

39. Veeco filed its Original Complaint in this action on April 12, 2017, alleging infringement of the '769 and '252 Patents. Veeco's counsel provided a courtesy copy of the Original Complaint to SGL and its counsel on April 13, 2017.

40. Upon information and belief, SGL was at least willfully blind to the existence of the Asserted Patents, and SGL's infringement thereof, at least as of January 2017, when

executives from Veeco and SGL met in person to discuss IP concerns surrounding the wafer carriers, and further as of March 2017, when SGL received correspondence from Veeco relating to SGL's infringement of patents relating to wafer carrier technology. A reasonable company in SGL's position would have investigated these claims. To the extent SGL did not have actual knowledge of the Asserted Patents and its infringement thereof, SGL was willfully blind of Veeco's patent rights. *See Global-Tech Appliances, Inc. v. SEB S.A.*, 563 U.S. 754, 770-771 (2011) (affirming finding of willful blindness based on evidence of a subjective belief the product was patented and deliberate actions taken to avoid learning of the fact).

41. Defendants further had constructive knowledge of the Asserted Patents prior to the filing of the Complaint. Plaintiff has complied with the marking requirement of the Asserted Patents pursuant to 35 U.S.C. § 287(a). Specifically, Plaintiff has complied with § 287(a) by virtually marking its products. A list of Veeco's patents is available on the Internet, accessible to the public without charge, at <http://www.veeco.com/patents>, <http://www.veeco.com/privacy>, and <https://veeco.s3.amazonaws.com/2e72ae3bf177753216bf3739fb4d2b19.pdf>.

42. SGL has actual knowledge of the Asserted Patents and its infringement thereof at least as early as, and no later than April 13, 2017, when Veeco provided to SGL a courtesy copy of Original Complaint in this action.

COUNT ONE – INFRINGEMENT OF THE '769 PATENT

43. Plaintiff Veeco incorporates and realleges the allegations set forth in paragraphs 1- 42 herein.

44. Upon information and belief, without authority or license from Plaintiff, SGL has directly and indirectly infringed and is still directly and indirectly infringing one or more claims

of U.S. Patent No. 6,726,769 by making, using, testing, importing, distributing, exporting, selling and/or offering to sell wafer carriers that directly infringe, both literally and under the doctrine of equivalents, one or more claims of the '769 Patent, including but not limited to claims 1 and 22. Such Infringing Products include at least the wafer carriers manufactured and/or sold by SGL for use in AMEC MOCVD reactors. SGL's infringement has been willful and with full knowledge of the '769 Patent and its infringement thereof. SGL will continue to infringe unless enjoined by this Court.

Infringement under § 271(a)

45. Specifically (and without limitation), SGL infringes at least Claim 1 of the '769 Patent by making, using, testing, distributing, exporting, selling and/or offering to sell in the United States wafer carriers designed to be used in AMEC MOCVD reactors.

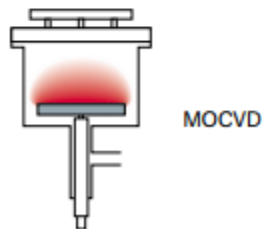
46. For example, every requirement in claim 1 is found in Infringing Products: To the extent the preamble of Claim 1 of the '769 is limiting, the Infringing Products comprise an apparatus for supporting and transporting at least one wafer in a CVD reactor having a rotatable spindle. SGL's advertising materials disclose a wafer carrier "supported by rotating susceptors or carriers," thereby transporting the wafer carrier within an MOCVD reactor:



During the extensive coating process in the MOCVD reactor, the substrate wafers are supported by rotating susceptors or carriers. The properties of the susceptor material have a key influence on coating quality and therefore on the chip reject rate.

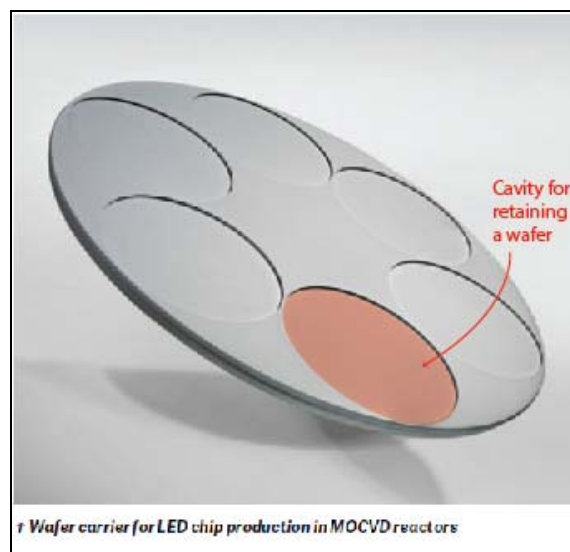
For many processes in semiconductor production, components made from specialty graphites are indispensable, e.g. in crystal growing or subsequent finishing by epitaxy, ion implantation or plasma etching, and also in the production of LED chips. This is because the processes usually operate at very high temperatures and in an extremely corrosive environment: at the same time, high purity and absolute precision are required.

For the challenging processes of semiconductor production, we offer reliable solutions with specialty graphites.



See SGL Carrier Brochure (highlighted). Moreover, SGL's Infringing Products are designed to operate in AMEC MOCVD reactors, and AMEC MOCVD reactors must use a transportable apparatus to support at least one wafer to attain "full automation" as advertised. *AMEC Sees Growing Demand for Its MOCVD Technology in China and Taiwan*, <http://www.amec-inc.com/en/news-detail.php?id=73> (, Mar. 16, 2015) (hereinafter "AMEC News Release") (last visited July 20, 2017).

47. SGL's advertising materials further disclose a wafer carrier with a top surface having at least one cavity for retaining said at least one wafer:



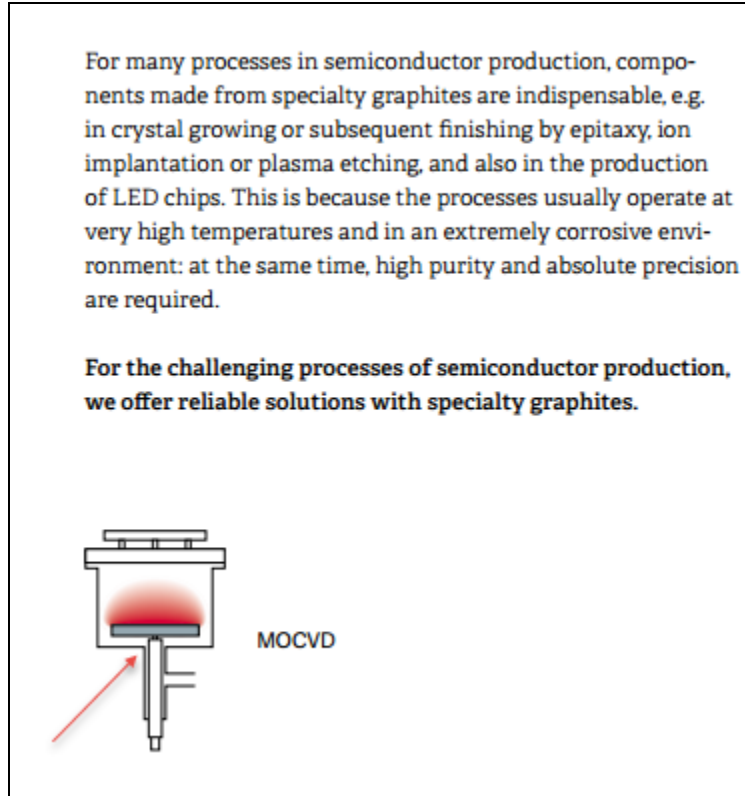
See SGL Carrier Brochure (annotated). Moreover, SGL's Infringing Products are designed to operate in AMEC MOCVD reactors, and AMEC MOCVD tools require the use of an apparatus with at least one cavity on its top surface to operate its reactor. AMEC News Release (touting "2- and- 4-inch wafer processing" referring to the size of the cavities).

48. Upon information and belief, the Infringing Products have a bottom surface having a central recess adapted for detachably inserting an upper end of said rotatable spindle.

SGL's advertising materials disclose a rotating wafer carrier (as shown below), and the Infringing Products are similar to the wafer carrier shown in such materials. SGL admits it provides similar wafer carriers to AMEC (see Dkt. No. 12 at 1):



During the extensive coating process in the MOCVD reactor, the substrate wafers are supported by rotating susceptors or carriers. The properties of the susceptor material have a key influence on coating quality and therefore on the chip reject rate.

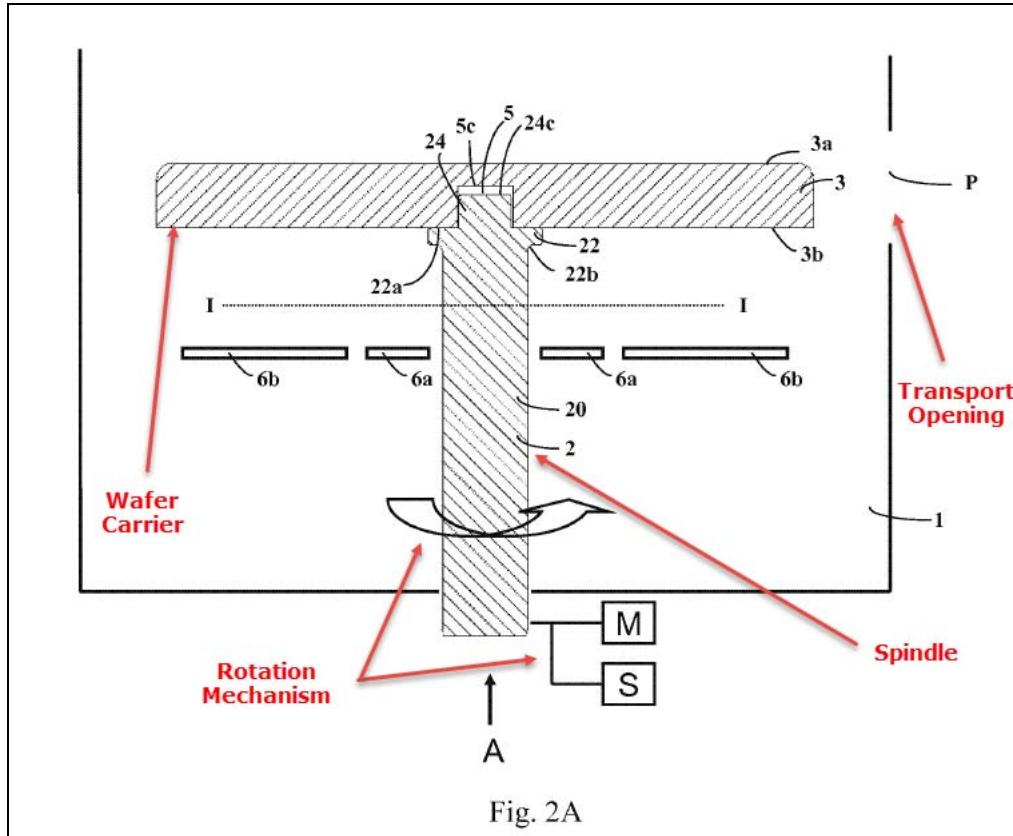


See SGL Carrier Brochure (annotated and highlighted). As depicted in the above diagram from SGL's advertising materials, the rotating wafer carrier sits on top of the end of a spindle via a central recess (as indicated by arrow in diagram).

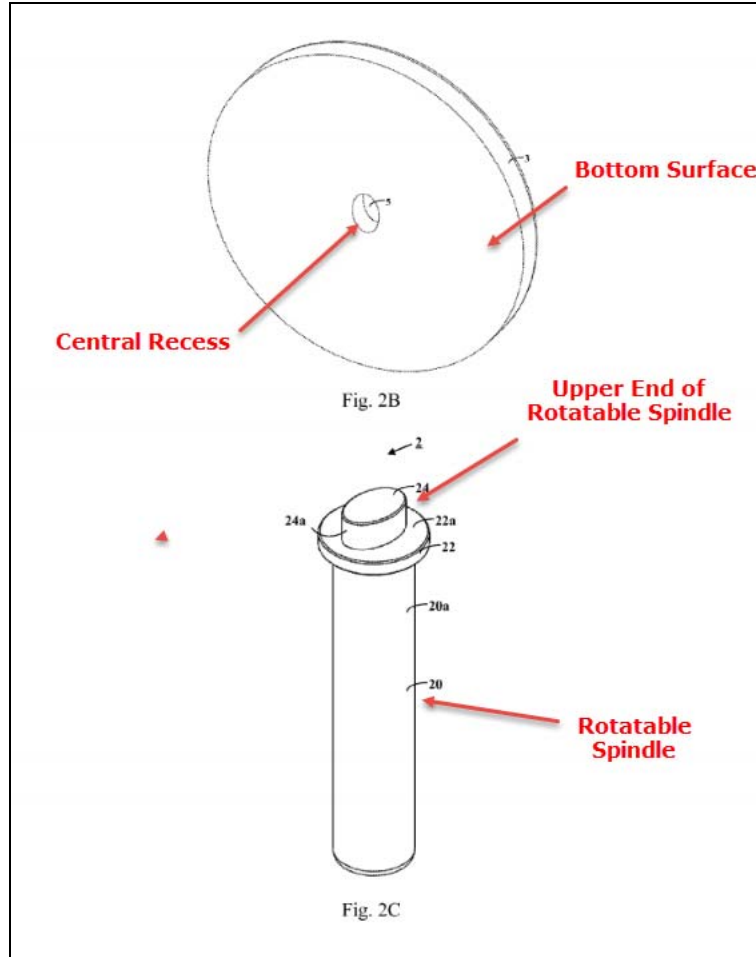
49. Moreover, SGL's Infringing Products are designed to operate in AMEC MOCVD reactors, and upon information and belief, AMEC MOCVD tools require wafer carriers having a bottom surface with a central recess adapted for detachably inserting an upper end of said rotatable spindle. Upon information and belief, the AMEC MOCVD system embodies the technology disclosed in AMEC's U.S. patent application, published by the USPTO on May 23, 2013, AMEC's '768 Application.

50. AMEC's '768 Application was filed nearly ten years after the '769 Patent was filed and contains figures and disclosures which, upon information and belief, describe AMEC's

MOCVD reactor and wafer carrier technology used therein. For example, AMEC described one of the objects of its purported invention is to provide a wafer carrier detachably connected to a spindle and designed to rotate evenly and reliably. *See* AMEC's '768 Application at [0006] ("to provide a supporter applicable in the reactor, which can be detachably connected to a substrate carrier to rotate evenly and reliably in substrate process"). AMEC's MOCVD reactor uses a carrier with cavities. *Id.* at [0030] ("The substrate carrier [preferably] is provided with grooves or notches [] for placing [] substrates to be processed"). In AMEC's MOCVD reactor, the spindle drives the rotation. *Id.* at [0031] ("[t]he substrate carrier 3 is supported by supporter 2 throughout the following substrate processing . . . [and] the supporter 2 is connected to a rotary mechanism"). And AMEC's MOCVD reactor is designed to use wafer carriers that are transportable in the normal course of operation between a position in which the spindle is inserted into a central recess, and an position detached from the central recess. *Id.* at [0031] ("After the substrate processing is finished . . . [t]he substrate carrier 3 is detached from the supporter 2 by the robot . . . and then is sent out of the reaction chamber 1 through the transport opening P."). This functionality is further described in the figures accompanying AMEC's application:



AMEC's '768 Application, Fig. 2A (annotated). As shown in AMEC's patent application, to be compatible with AMEC MOCVD tools, SGL's Infringing Products must have cavities on the top surface for holding one or more wafers, a central recess on the bottom surface to interface with the top of the spindle, and be transportable through the transport opening.



AMEC's '768 Application, Figs. 2B and 2C (annotated)

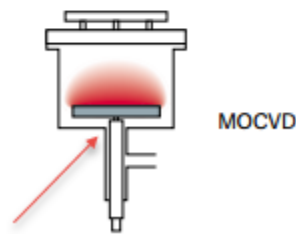
51. Upon information and belief, the Infringing Products are manufactured by SGL to AMEC's specifications and are sold by SGL to AMEC and/or AMEC's customers for use in AMEC MOCVD reactors that are similar to those described in AMEC's '768 Application.

52. Upon information and belief, each Infringing Product is transportable, in the normal course of operation of the CVD reactor, between a position in which said spindle is inserted into said central recess for rotation therewith and a position detached from said spindle:

During the extensive coating process in the MOCVD reactor, the substrate wafers are supported by rotating susceptors or carriers. The properties of the susceptor material have a key influence on coating quality and therefore on the chip reject rate.

For many processes in semiconductor production, components made from specialty graphites are indispensable, e.g. in crystal growing or subsequent finishing by epitaxy, ion implantation or plasma etching, and also in the production of LED chips. This is because the processes usually operate at very high temperatures and in an extremely corrosive environment: at the same time, high purity and absolute precision are required.

For the challenging processes of semiconductor production, we offer reliable solutions with specialty graphites.



See SGL Carrier Brochure (annotated and highlighted). AMEC's MOCVD reactors must use transportable wafer carriers to attain "full automation" as advertised. See AMEC News Release.

53. Veeco hereby incorporates by reference the Declaration of Dr. Alexander Glew in support of Veeco's motion for a preliminary injunction, filed July 21, 2017.

Infringement under § 271(f)(2)

54. Upon information and belief, SGL also infringes the '769 Patent within the meaning of 35 U.S.C. § 271(f)(2). Infringing Products include at least the removable wafer carriers manufactured and/or sold by SGL that are especially made and adapted for use in AMEC

MOCVD reactors (each of which has a rotatable spindle), and the Infringing Products can only be used to, and are intended to, infringe claims of the '769 Patent, including but not limited to claim 1.

55. SGL, with knowledge of the '769 Patent, has supplied or has caused to be supplied a component of a wafer-supporting assembly, the Infringing Products, from the United States to a place outside of the United States and continues to supply or cause to be supplied to customers (including AMEC and AMEC's customers, such as, without limitation, China-based Sanan and HC Semitek) the Infringing Products from manufacturing facilities in the United States.

56. Upon information and belief, the only substantial use for the Infringing Products is in an AMEC MOCVD reactor which would infringe if the combination of the Infringing Products with the AMEC MOCVD reactor occurred in the United States. SGL admits that each wafer carrier it sells is "custom made exactly based on the specification, designs, and/or drawings of each customer" and thus have no other use. (See Dkt. No. 12 at 1). SGL's Infringing Products are designed to operate in AMEC MOCVD Reactors. On information and belief, AMEC MOCVD reactor design mirrors that in the AMEC Application. AMEC MOCVD reactors include a wafer carrier detachably connected to a spindle and designed to rotate evenly and reliably. See AMEC's '768 Application at [0006] ("to provide a supporter applicable in the reactor, which can be detachably connected to a substrate carrier to rotate evenly and reliably in substrate process"). The Infringing Products are especially made or adapted for use in infringing the '769 Patent, and are not a staple articles of commerce. Furthermore, the Infringing Products have no substantial non-infringing uses. Thus the only substantial use would infringe if

combined in the United States. See Infringement under § 271(a), *supra*.

57. A showing of an actual combination of components abroad in a manner that would be direct infringement if such combination occurred in the U.S. is not required under Section 271(f)(2). *E.g.*, *Waymark Corporation v. Porta Systems Corp.*, 245 F. 3d 1364, 1368 (Fed. Cir. 2001) (“the statutory language in this section does not require an actual combination of the components, but only a showing that the infringer shipped them with the intent that they be combined.”).

58. As described above and below, SGL is aware of the '769 Patent or at minimum was willfully blind as to the existence of the '769 Patent. SGL knows the Infringing Products have no other substantial use. (See Dkt. No. 12 at 1 (admitting that each wafer carrier SGL sells is “custom made exactly based on the specification, designs, and/or drawings of each customer”)). Upon information and belief, SGL knew or was willfully blind as to whether its Infringing Products may be covered by at least one claim of the '769 Patent.

59. SGL supplied and continues to supply the Infringing Products to persons outside of the United States with intent that the Infringing Products will be combined outside of the United States in an MOCVD reactor in a manner that would infringe the '769 Patent if such combination occurred within the United States. (See Dkt. No. 12 at *1 (admitting that each wafer carrier SGL sells is “custom made exactly based on the specification, designs, and/or drawings of each customer”); Infringement Under § 271(a) section, *supra*).

Contributory Infringement under § 271(c)

60. Additionally, to the extent SGL sells, offers for sale, or supplies any wafer carriers to entities, such as SGL's customers and/or third party testing entities, who assemble

those wafer carriers into MOCVD reactors containing a rotatable spindle in the United States without authorization, SGL is liable for infringement under 35 U.S.C. § 271(c). SGL knew of or was willfully blind as to the existence of the '769 Patent. SGL sold and supplied and continues to sell and supply Infringing Products that are a significant and material part of the wafer-supporting assembly. See SGL Carrier Brochure (showing MOCVD assembly and noting that “For many processes in semiconductor production, components made from specialty graphites are *indispensable*, e.g., . . . and also in the production of LED chips.” (emphasis added)). To the extent any entities, such as SGL’s customers and/or third party testing entities, assemble the Infringing Products into MOCVD reactors in the United States without authorization, those entities directly infringe the '769 Patent, including but not limited to claim 22, using the Infringing Products. SGL knew the Infringing Products were especially made or adapted for a use that would infringe the '769 Patent. (See Dkt. No. 12 at *1 (admitting that each wafer carrier SGL sells is “custom made exactly based on the specification, designs, and/or drawings of each customer”); see Infringement under § 271(a) section, *supra*). The component is not commonly available and has no substantial non-infringing uses. *Id.*

Induced Infringement under § 271(b)

61. To the extent that SGL sells or supplies any wafer carriers to entities, such as SGL’s customers and/or third party testing entities, who assemble those wafer carriers into MOCVD reactors in the United States without authorization, SGL is liable for induced infringement under 35 U.S.C. § 271(b). Specifically, SGL induces and continues to induce its U.S. customers and/or third party testing entities to directly infringe, both literally and under the doctrine of equivalents, one or more claims of the '769 Patent, including but not limited to

claims 1 and 22. SGL knew, was willfully blind to, and knows of the '769 Patent and infringement thereof. Through SGL's advertising and instructions for use of the Infringing Products, SGL specifically encourages and instructs its customers to use and test the Infringing Products in the United States in a manner that infringes claims of the '769 Patent, including but not limited to claim 1. SGL also specifically encourages and instructs its customers to engage in assembly in the United States using the Infringing Products in combination with a rotatable spindle that infringe claims of the '769 Patent, including but not limited to claim 22. Upon information and belief, as a result of SGL's advertising and instructions, SGL's customers have directly infringed and continue to infringe claims of the '769 Patent.

62. Furthermore, to the extent that SGL sells or supplies the Infringing Products to entities, such as SGL's retailers and/or distributors, who sell and/or offer for sale those Infringing Products in the United States without authorization, SGL is liable for induced infringement under 35 U.S.C. § 271(b). Specifically, SGL induces and continues to induce its U.S. retailers and/or distributors to directly infringe, both literally and under the doctrine of equivalents, one or more claims of the '769 Patent, including but not limited to claim 1. SGL knew, was willfully blind to, and knows of the '769 Patent and infringement thereof. On information and belief, SGL specifically encourages and instructs its retailers and/or distributors to sell and/or offer for sale the Infringing Products in the United States without authorization. Upon information and belief, as a result of SGL's advertising and instructions, SGL's retailers and/or distributors have directly infringed and continue to infringe claims of the '769 Patent, including but not limited to claim 1.

Damage and Harm to Veeco

63. Plaintiff has suffered irreparable harm as a result of SGL's willful violation of

Plaintiff's rights, including lost customers, lost market share, and/or price erosion relating to its MOCVD systems, and is therefore entitled to a preliminary and/or permanent injunction.

64. In addition to an injunction, Plaintiff is entitled to recover damages adequate to compensate it for Defendants' infringement of the '769 Patent, including lost profits relating to its MOCVD systems, but in no event less than a reasonable royalty for past and/or future damages.

65. SGL's commercial activities relating to the Infringing Products have continued and are continuing with knowledge of the '769 Patent, and with knowledge of their infringement of the '769 Patent. These commercial activities are, at a minimum, done with reckless disregard and/or willful blindness of Plaintiff's rights under the '769 Patent. SGL's acts of infringement have therefore been intentional, deliberate, and willful.

66. This case is exceptional and, therefore, Plaintiff is entitled to an award of attorneys' fees.

COUNT TWO – INFRINGEMENT OF THE '252 PATENT

67. Plaintiff Veeco incorporates and realleges the allegations set forth in paragraphs 1- 66 herein.

68. Upon information and belief, without authority or license from Plaintiff, SGL has infringed and is still infringing one or more claims of the U.S. Patent No. 6,506,252.

69. SGL's infringement has been willful and with full knowledge of the '252 Patent and its infringement thereof. SGL will continue to do so unless enjoined by this court.

70. Specifically (and without limitation), SGL infringes at least Claim 1 of the '252 Patent by supplying from the U.S. Infringing Products for use in AMEC MOCVD Reactors

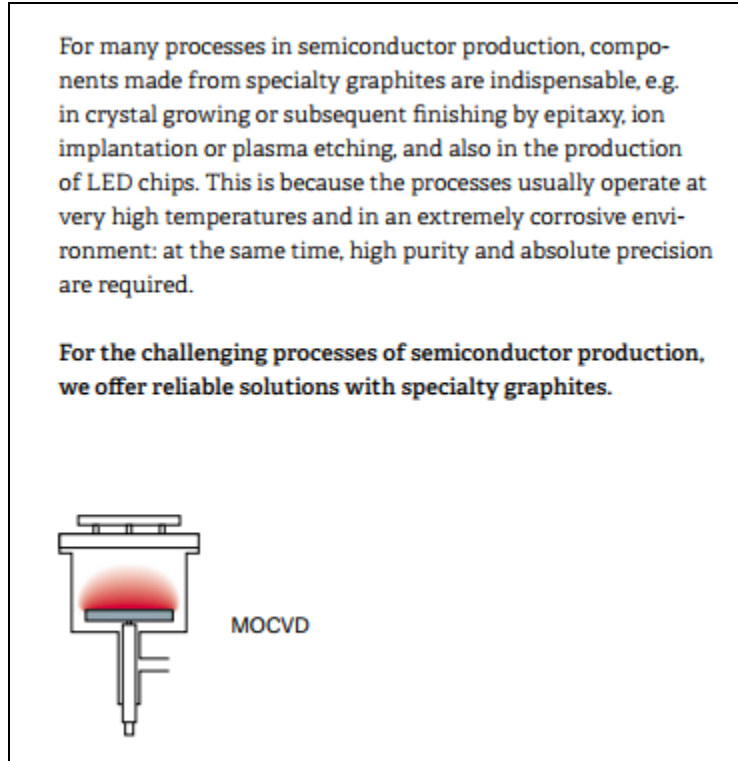
abroad, knowing and intending that the Infringing Products will be combined with and used in AMEC MOCVD Reactors in a manner that would infringe if such combination occurred in the U.S.

The Combination of SGL's Infringing Products and AMEC Reactor Would Infringe in the U.S.

71. Upon information and belief, and to the extent the preamble is limiting, the Infringing Products are especially made for use in a vertical apparatus for growing epitaxial layers on one or more wafers by chemical vapor deposition, such as the AMEC Prismo D-Blue MOCVD system. See <http://www.amec-inc.com/products/MOCVD.php> (last visited July 19, 2017). SGL admits that it sells wafer carriers “to other customers around the world, including to China-based AMEC” and that each wafer carrier is “custom made exactly based on the specification, designs, and/or drawings of each customer.” (see Dkt. No. 12 at 1).

72. Upon information and belief, the Infringing Products are especially made for use in said vertical apparatus comprising a reaction chamber and a rotatable spindle having an upper end disposed inside said reaction chamber:

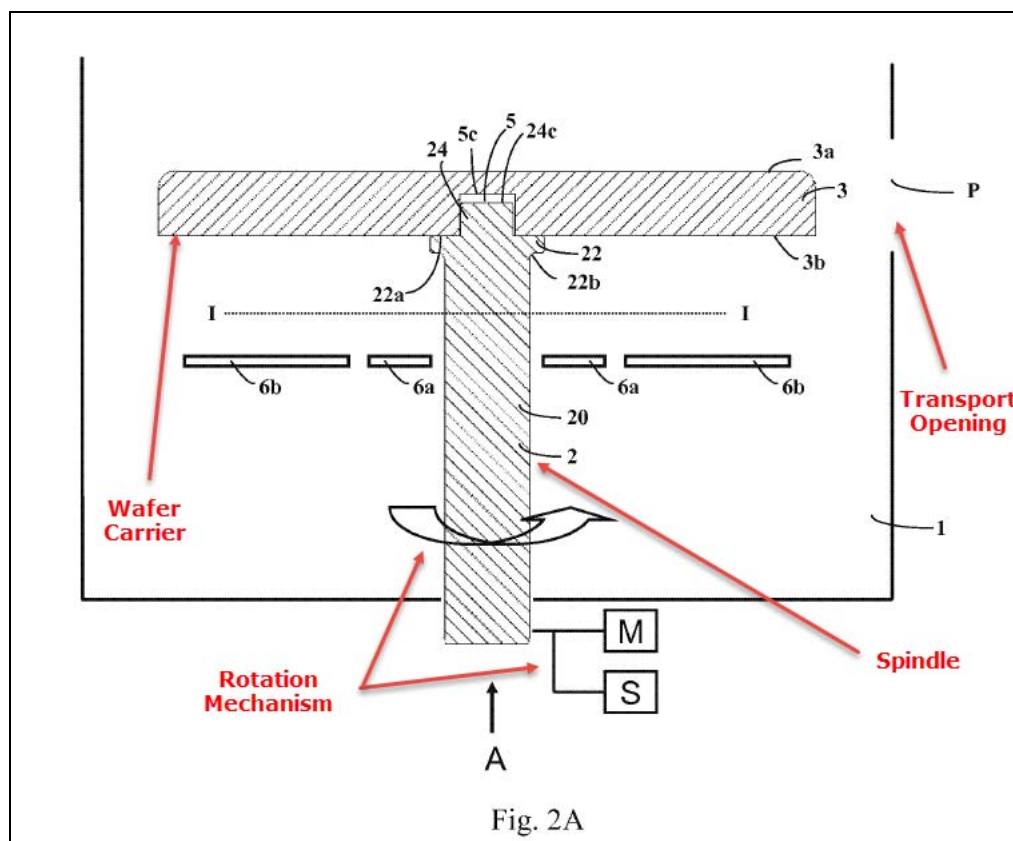
During the extensive coating process in the MOCVD reactor, the substrate wafers are supported by rotating susceptors or carriers. The properties of the susceptor material have a key influence on coating quality and therefore on the chip reject rate.



See SGL Carrier Brochure (highlighted, with diagram showing reaction chamber with rotatable spindle and wafer carrier and implying existence of radiant heating element through heat dispersal pattern).

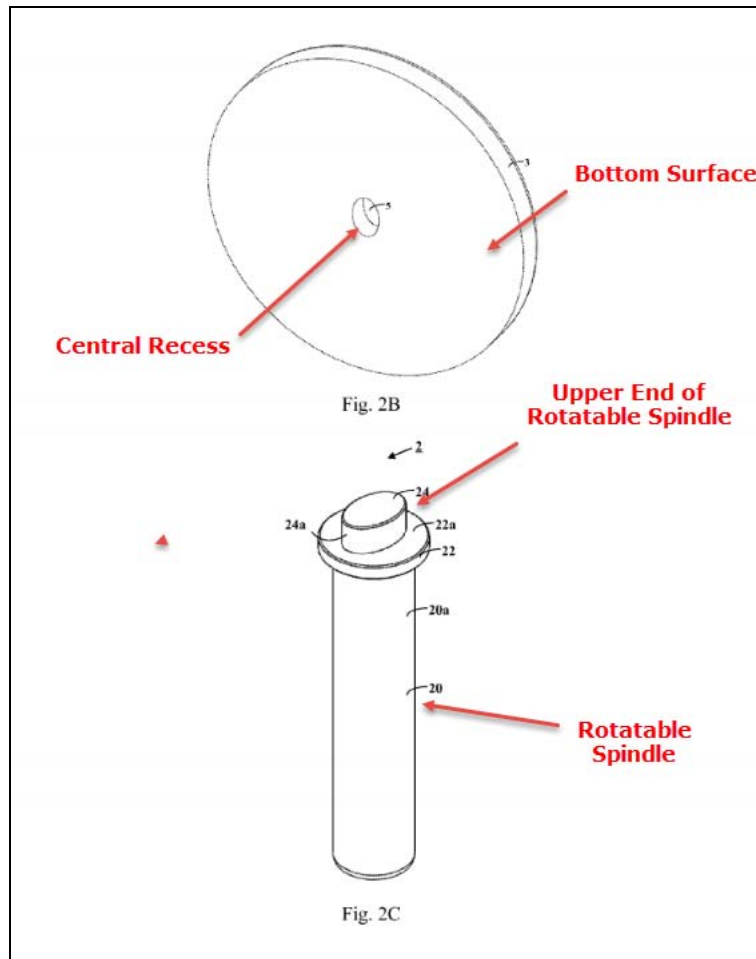
73. AMEC's '768 Application was filed ten years after the '252 Patent was filed and contains figures and disclosures which, upon information and belief, describe AMEC's MOCVD reactor and wafer carrier technology used therein. For example, AMEC described one of the objects of its purported invention is to provide a wafer carrier detachably connected to a spindle and designed to rotate evenly and reliably. See AMEC's '768 Application at [0006] ("to provide a supporter applicable in the reactor, which can be detachably connected to a substrate carrier to rotate evenly and reliably in substrate process"). AMEC's MOCVD reactor uses a carrier with cavities. *Id.* at [0030] ("The substrate carrier [preferably] is provided with grooves or notches [] for placing [] substrates to be processed"). In AMEC's MOCVD reactor, the spindle drives the

rotation. *Id.* at [0031] (“[t]he substrate carrier 3 is supported by supporter 2 throughout the following substrate processing. The supporter 2 is also connected to a rotary mechanism M”). And AMEC’s MOCVD reactor is designed to use wafer carriers that are transportable in the normal course of operation between a position in which the spindle is inserted into a central recess, and an position detached from the central recess. *Id.* at [0031] (“After the substrate processing is finished . . . [t]he substrate carrier 3 is detached from the supporter 2 by the robot . . . and then is sent out of the reaction chamber 1 through the transport opening P.”). This functionality is further described in the figures accompanying AMEC’s application:



AMEC's '768 Application, Fig. 2A (Annotated) (Diagram showing reaction chamber, rotatable spindle with an upper end inside the reaction chamber, a wafer carrier detachably mounted on the

spindle and removable for transport through the transport opening, and radiant heating element underneath the wafer carrier).



AMEC's '768 Application, Figs. 2B and 2C (annotated).

74. Upon information and belief, the Infringing Products are manufactured by SGL to AMEC's specifications and sold by SGL to AMEC and/or AMEC's customers, and are especially made for use in AMEC MOCVD reactors that are similar to those described in AMEC's '768 Application. SGL admits that each wafer carrier it sells is "custom made exactly based on the specification, designs, and/or drawings of each customer." (see Dkt. No. 12 at *1).

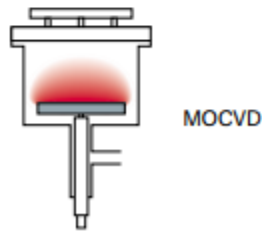
75. Upon information and belief, the Infringing Products transport and provide support for one or more wafers; the wafer carrier is centrally and detachably mounted to the upper end of said spindle and is in contact therewith during the course of the deposition; the Infringing Products are readily removable from the upper end of said spindle for transporting the Infringing Products to load or unload one or more wafers; and a radiant heating element is disposed under the Infringing Products for heating the wafer carrier:



During the extensive coating process in the MOCVD reactor, the substrate wafers are supported by rotating susceptors or carriers. The properties of the susceptor material have a key influence on coating quality and therefore on the chip reject rate.

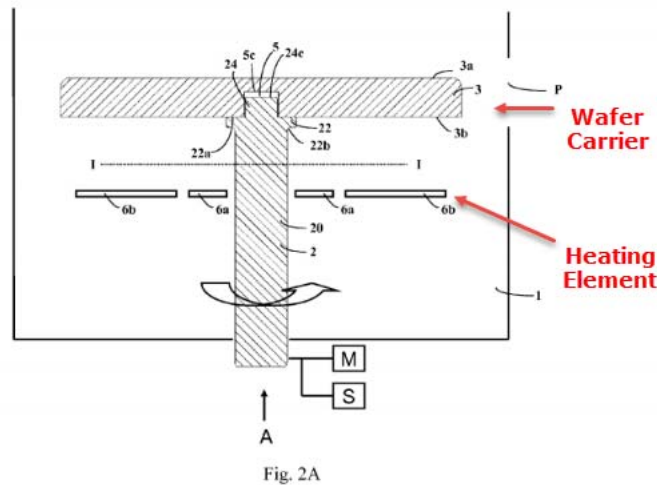
For many processes in semiconductor production, components made from specialty graphites are indispensable, e.g. in crystal growing or subsequent finishing by epitaxy, ion implantation or plasma etching, and also in the production of LED chips. This is because the processes usually operate at very high temperatures and in an extremely corrosive environment: at the same time, high purity and absolute precision are required.

For the challenging processes of semiconductor production, we offer reliable solutions with specialty graphites.



See SGL Carrier Brochure (highlighted).

76. AMEC's '768 Application further describes its reaction chamber for the MOCVD process, including that "a heater is further provided under the substrate carrier 3 to heat the substrates on the substrate carrier 3. In order to heat the substrate uniformly, a first heater 6a and a second heater 6b may be provided under the substrate carrier 3. The first heater 6a is arranged close to the supporter 2." AMEC's '768 Application, [0038]. This is further shown below:



AMEC's '768 Application, Fig. 2A (annotated).

77. AMEC's '768 Application further describes the type of heating that, upon information and belief, is used in AMEC's MOCVD reactors, including that "[S]everal hollowed-out structures or cutouts (not shown) may be provided in the above-mentioned spindle part 90 or 190 and close to the supporting surface 92 or 192. These 10 hollowed-out structures or cutouts may facilitate the direct conduction and **radiation** of the heat from the heater located under the substrate carrier 13 or 113 to the second surface of the substrate carrier 13 or 113." AMEC's '768 Application, [0055].

Infringement under § 271(f)(2)

78. SGL infringes the '252 Patent within the meaning of 35 U.S.C. § 271(f)(2). The Infringing Products include at least the removable wafer carriers manufactured, sold by, and/or supplied from the U.S. by SGL for use in AMEC MOCVD reactors, and the Infringing Products can only be used to, and are intended to, infringe claims of the '252 Patent, including but not limited to claim 1.

79. SGL, with knowledge of the '252 Patent, has supplied or has caused to be supplied a component of a wafer-supporting assembly, the Infringing Products, from the United States to a place outside of the United States and continues to supply or cause to be supplied to customers (including AMEC and AMEC's customers, such as, without limitation, China-based Sanan and HC Semitek) the Infringing Products from manufacturing and sales facilities in the United States.

80. The intended and only substantial use for the Infringing Products is in an AMEC MOCVD reactor which would infringe the '252 Patent if the combination of the Infringing Products with the AMEC MOCVD reactor occurred in the United States. SGL admits that each wafer carrier it sells is "custom made exactly based on the specification, designs, and/or drawings of each customer" and thus have no other substantial use. (*see* Dkt. No. 12 at 1). SGL's Infringing Products are designed to operate in AMEC MOCVD Reactors. As described below, the Infringing Products in combination with AMEC's MOCVD reactors would infringe if the combination occurred in the United States. The Infringing Products are especially made or adapted for use in infringing the '252 Patent, and are not a staple articles of commerce. Furthermore, the Infringing Products have no substantial non-infringing uses. Thus the only substantial use would infringe if combined in the United States. *See* Combination of SGL's Infringing Products and AMEC MOCVD Reactor Infringes section, *supra*.

81. A showing of an actual combination of components abroad in a manner that would be direct infringement if such combination occurred in the U.S. is not required under Section 271(f)(2). *E.g., Waymark Corporation v. Porta Systems Corp.*, 245 F. 3d 1364, 1368 (Fed. Cir. 2001) ("the statutory language in this section does not require an actual combination of

the components, but only a showing that the infringer shipped them with the intent that they be combined.”).

82. As described above and below, SGL is aware of the '252 Patent or at minimum was willfully blind as to the existence of the '252 Patent. SGL knows the Infringing Products have no other substantial use. (See Dkt. No. 12 at 1 (admitting that each wafer carrier SGL sells is “custom made exactly based on the specification, designs, and/or drawings of each customer”)). Upon information and belief, SGL knew or was willfully blind as to whether its Infringing Products may be covered by a claim of the '769 Patent.

83. SGL supplied and continues to supply the Infringing Products to persons and entities outside of the United States with intent that the Infringing Products will be combined outside of the United States in an MOCVD reactor in a manner that would infringe the '252 Patent if such combination occurred within the United States. (See Dkt. No. 12 at 1 (admitting that each wafer carrier SGL sells is “custom made exactly based on the specification, designs, and/or drawings of each customer”); Direct Infringement section, *supra*).

Contributory Infringement under § 271(c)

84. Additionally, to the extent SGL sells, offers for sale, or supplies any wafer carriers to entities, such as SGL's customers or third party testing entities, who assemble those wafer carriers into MOCVD reactors in the United States without authorization, SGL is liable for infringement under 35 U.S.C. § 271(c). SGL knew of or was willfully blind as to the existence of the '252 Patent. SGL sold and supplied and continues to sell and supply Infringing Products that are a significant and material part of the wafer-supporting assembly. See SGL Carrier Brochure (showing MOCVD assembly and nothing that “For many processes in semiconductor

production, components made from specialty graphites are *indispensable*, e.g., . . . and also in the production of LED chips.” (emphasis added)). To the extent any entities, such as SGL’s customers or third party testing entities, incorporate or assemble the Infringing Products into MOCVD reactors in the United States and/or use or test such combination without authorization, those entities directly infringe the ’252 Patent, including but not limited to claim 1, using the Infringing Products. SGL knew the Infringing Products were especially made or adapted for a use that would infringe the ’252 Patent. (See Dkt. No. 12 at 1 (admitting that each wafer carrier SGL sells is “custom made exactly based on the specification, designs, and/or drawings of each customer”); See § 271(f)(2) Infringement section, *supra*). The component is not commonly available and has no substantial non-infringing uses. *Id.*

Induced Infringement under § 271(b)

85. To the extent that SGL sells or supplies the Infringing Products to entities, such as SGL’s customers and/or third party testing entities, who assemble those wafer carriers into MOCVD reactors in the United States without authorization, SGL is liable for induced infringement under 35 U.S.C. § 271(b). Specifically, SGL induces and continues to induce its U.S. customers and/or third party testing entities to directly infringe, both literally and under the doctrine of equivalents, one or more claims of the ’252 Patent, including but not limited to claim 1. SGL knew, was willfully blind to, and knows of the ’252 Patent and infringement thereof. Through SGL’s advertising and instructions for use of the Infringing Products, SGL specifically encourages and instructs its customers and/or third party testing entities to engage in assembly and/or uses in the United States of the Infringing Products with MOCVD Reactors in a manner that infringe claims of the ’252 Patent, including but not limited to claim 1. Upon information

and belief, as a result of SGL's advertising and instructions, SGL's customers have directly infringed and continue to infringe claims of the '252 Patent.

Damages and Harm to Veeco

86. Plaintiff has suffered irreparable harm as a result of SGL's willful infringement of the '252 Patent, including lost customers, lost market share, and/or price erosion relating to its MOCVD systems, and is therefore entitled to a preliminary injunction and/or permanent injunction.

87. In addition to an injunction, Plaintiff is entitled to recover damages adequate to compensate it for Defendants' infringement of the '252 Patent, including lost profits relating to its MOCVD systems, but in no event less than a reasonable royalty for past and/or future damages.

88. SGL's commercial activities relating to the Infringing Products have continued and are continuing with knowledge of the '252 Patent, and with knowledge of their infringement of the '252 Patent. These commercial activities are, at a minimum, done with reckless disregard and/or willful blindness of Plaintiff's rights under the '252 Patent. SGL's acts of infringement have therefore been intentional, deliberate, and willful.

89. This case is exceptional and, therefore, Plaintiff is entitled to an award of attorneys' fees.

PRAYER FOR RELIEF

WHEREFORE, Plaintiff Veeco asks this Court to enter judgment against Defendants SGL Carbon SE and SGL Carbon, LLC and to grant the following relief:

1. A finding that each of the Asserted Patents has been infringed by SGL;

2. A preliminary injunction under 35 U.S.C. § 283 prohibiting further infringement of the Asserted Patents;

3. A permanent injunction under 35 U.S.C. § 283 prohibiting further infringement of the Asserted Patents;

4. An award of damages adequate to compensate Plaintiff for SGL's infringement of the Asserted Patents, including lost profits, and in no event less than a reasonable royalty for past sales, together with prejudgment interest;

5. A finding of willful infringement by SGL and an award to Plaintiff of enhanced damages pursuant to 35 U.S.C. § 284;

6. A finding that this case is exceptional and an award of Plaintiff's attorneys' fees pursuant to 35 U.S.C. § 285;

7. A finding that, if no injunction is granted, that Plaintiff is entitled to future royalties; and

8. Such other and further relief as this Court may deem proper and just.

JURY DEMAND

Plaintiff demands a trial by jury on all issues so triable.

Dated: July 21, 2017

VEECO INSTRUMENTS INC.

By its attorneys,

/s/ Andrew N. Thomases_____

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CERTIFICATE OF SERVICE

I hereby certify that on July 21, 2017, the foregoing document was filed with the Clerk of the Court and served in accordance with the Eastern District's Rules on Electronic Service upon the following parties and participants:

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Attorney for SGL Carbon, LLC and SGL Carbon SE

Dated: New York, NY
July 21, 2017

/s/ Cassandra B. Roth
Cassandra B. Roth