UNITED STATES INTERNATIONAL TRADE COMMISSION
WASHINGTON, DC

In the Matter of CERTAIN PREPREGS, LAMINATES, AND FINISHED CIRCUIT BOARDS	Investigation No. 337-TA-659

COMPLAINT FOR ENFORCEMENT PROCEEDINGS UNDER 19 C.F.R. 210.75

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Complainant

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Proposed Respondents

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I. INTRODUCTION.

1. This Enforcement Complaint involves PCBs and the base materials used to fabricate PCBs, namely prepregs and laminates, each of which are based on epoxy resin. Multilayer PCBs are used in virtually all advanced electronic equipment to direct, sequence and control electronic signals between semiconductor devices (such as microprocessors and memory and logic devices), passive components (such as resistors and capacitors) and connection devices (such as infra-red couplings, fiber optics and surface mount connectors). Examples of the end uses of PCBs include high-speed routers and servers, storage area networks, supercomputers, laptops, satellite switching equipment, cellular telephones and transceivers, wireless personal digital assistants, and wireless local area networks. These articles can contain a material called "talc."

2. On October 6, 2008, Complainant Isola USA Corp. ("Isola") filed a Complaint for Violation of Section 337 of the Tariff Act of 1930, as amended, which named multiple respondents including Respondent Taiwan Union Technology Corp. ("TUC"). On October 28, 2008, Isola filed a Supplement to the Complaint. *See* Exhibit 4. On November 12, 2008, the Commission instituted Investigation No. 337-TA-659, *In re Matter of Certain Prepregs, Laminates, and Finished Circuit Boards,* which was assigned to Administrative Law Judge Charles E. Bullock.

3. On March 12, 2009, Administrative Law Judge Bullock entered a Consent Order between Complainant Isola USA Corp. ("Isola") and Respondent Taiwan Union Technology Corp. ("TUC"). In relevant part, the Consent Order stated:

> Upon entry of this Consent Order, TUC shall not import, sell for importation, or sell after importation into the United States, or knowingly aid, abet, encourage, participate in, or induce the importation into the United States of prepregs and laminates that are the subject of this Investigation, or otherwise infringe, or induce, and/or contribute to the infringement of claims 1-3, 5 and 8 of U.S. Patent No. 6,187,852, and claims 1, 2, 4, and 7-9 of U.S. Patent No. 6,322,885 (collectively, the Asserted Claims) except under consent or license from Isola, its successors, or assigns.

Exhibit 1, Inv. No. 337-TA-659, Order No. 10 (March 12, 2009).

4. As part of the Stipulation signed by the parties to obtain the consent order, TUC agreed that it would not "challenge the validity of claims 1-3, 5 and 8 of U.S. Patent No. 6,187,852 and claims 1, 2, 4, and 7-9 of U.S. Patent No. 6,322,885 in any administrative or judicial proceeding to enforce the Consent Order..." *See* Exhibit 1, Appendix B: "Joint Consent Order Stipulation."

5. On April 10, 2009, the Commission issued a Notice of Commission Determination Not to Review an Initial Determination Granting a Joint Motion to Terminate the Investigation as to Taiwan Union Technology Corp. Exhibit 2.

6. Despite the Consent Order between Isola and TUC, the Initial Determination, and the Commission Determination, TUC and/or parties acting in concert with TUC have resumed manufacturing, importing, and/or selling for importation prepregs and laminates that infringe at least claim 1 of U.S. Patent No. 6,187,852 ("the '852 patent"), and at least claim 1 of U.S. Patent No. 6,322,885 ("the '885 patent").

7. In the original complaint, Isola alleged: "TUC manufactures and/or has manufactured, imports into the United States and/or sells for importation into the United States the PCB Materials under the article designations TU 662, TU 66P, TU 752 and TU 75P." Exhibit 3; *see also* Exhibit 4.

8. Now, TUC and/or parties acting in concert with TUC import infringing articles identified as TU-862 HF and TU-86P HF ("the Accused Articles"). As demonstrated below and in the attached exhibits, the Accused Articles do not differ in any material way from the TU 662, TU 66P, TU 752 and TU 75P articles that were the subject of the Consent Order because they are comprised at least partially by talc that infringes, directly and indirectly, at least claim 1 of the '852 patent and at least claim 1 of the '885 patent .

9. Neither TUC nor any parties acting in concert with TUC have received consent or a license from Isola to import the Accused Articles. As such, they are in direct violation of the Consent Order, causing significant damage to complainant Isola's business in the United States.

II. JURISDICTION.

10. The Commission has jurisdiction over this matter and the proposed parties pursuant to Section 337 of the Tariff Act of 1930, as amended, 19 U.S.C. Section 1337. The parties stipulated that the Commission has jurisdiction in their Consent Order Stipulation. *See* Exhibit 1, Appendix B: "Joint Consent Order Stipulation."

III. PARTIES.

A. Complainant Isola USA Corp.

11. Complainant Isola is a corporation organized and existing under the laws of Delaware, with offices located at 3100 West Ray Road, Chandler, AZ 85224. Isola is the assignee of all right, title, and interest in the patents-in-suit. Isola is a technology-driven global designer, developer and manufacturer of high performance base materials used in the manufacture of advanced multilayer PCBs worldwide. Isola, itself and through its parent company Isola Group S.a.r.l., manufactures prepregs and laminates for PCB fabricators at its 11 fully integrated facilities located in the United States, Europe and Southeast Asia. Isola services

the North America market principally through its United States manufacturing and research and development facilities located in Chandler, Arizona; Ridgeway, South Carolina; and Elk Grove, California.

12. Isola's roots date back to the founding of Continentale Isola Werke AG in 1912 and the founding of Northern Plastics in 1945. Since the mid-1950s, Isola and its predecessor companies have been manufacturing prepregs and laminates for PCB fabrication.

13. In the past several years, legislative changes have restricted the use of lead in electronics for environmental and health reasons. This has prompted original equipment manufacturers ("OEMs") such as Dell, Cisco, Sun Microsystems and others, as well as contract manufacturers, PCB fabricators and material suppliers, to design PCBs that use new lead-free alloys. These new alloys, however, have the drawback of requiring assembly temperatures in the range of 20°C to 40°C higher than previous lead-containing PCBs. This transition to lead-free materials has required prepreg and laminate manufacturers led by Isola to develop new base materials that can withstand the necessary high assembly temperatures. While the Industry developed chemistries to solve the higher assembly temperature problem, new problems arose, including the thermal expansion that is associated with the thermal cycling of newly developed PCBs. To avoid the problems of thermal expansion, resin-based PCBs and the base materials (prepregs and laminates) used to fabricate them need to have a low z axis coefficient of expansion so that the differential stresses in the plated-through holes and interconnects between the copper and the base material can be reduced, thus reducing circuit failures. The z axis direction is in the plane perpendicular to the plane of the laminate (i.e., perpendicular to the x and y axes) and is always in the direction of the drilled holes.

14. To address the thermal expansion problem, Isola's research team pioneered the development of another class of high performance base materials. Such materials include Isola's 370HR laminate and prepreg articles that use an inorganic filler—talc. Isola adds the talc to the uncured epoxy resin formulation and then forms partially cured prepregs and laminates from the filled resin. The finished laminates demonstrate a number of unique advantages, including a low coefficient of thermal expansion (CTE) in the z axis direction. Moreover, laminates based on talc-containing epoxy resin exhibit reduced dust formation during processing (e.g., during punching, cutting and drilling) as compared to those laminates made using unfilled epoxy. Isola distributes and sells worldwide its patented talc-containing prepregs and laminates via its manufacturing locations in Elk Grove, California and in Ridgeway, South Carolina.

B. **Respondent Taiwan Union Technology Corp.**

15. Respondent TUC is a Taiwanese corporation that has a place of business at 803 Po Ai St., Chupei City, Hsinchu 302, Taiwan, R.O.C.

IV. THE PATENTS AT ISSUE.

A. Overview of the Patented Technology.

16. Multilayer PCBs are based on copper-clad laminates, which in turn are formed from prepregs. Prepregs are chemically and electrically engineered thermosetting or thermoplastic resin-based material systems that are formed from a resin impregnated into and reinforced by a specially manufactured fiberglass cloth article or other woven or non-woven reinforcing fiber. One or more plies of prepreg are laminated together to form an insulating dielectric laminate to support the copper circuitry patterns of a multilayer printed circuit board. Typical copper-clad laminates consist of one or more plies of prepreg laminated together with

specialty thin copper foil laminated on the top and bottom. In a copper-clad laminate, the dielectric material of the prepreg serves to insulate the copper layers from one another.

17. Both laminates and prepregs are sold to and used by PCB fabricators to construct multilayer PCBs. In a typical multilayer PCB manufacturing process, the fabricator photo-images a number of copper-clad laminates with a dry film or liquid photoresist. After development of the photoresist, the copper surfaces of these laminates are etched to form circuit patterns. The fabricator then assembles these etched copper-clad laminates together with one or more plies of additional prepreg and/or dielectric laminate material to form a multilayer structure. Outer layers of copper foil can be positioned on the top and/or bottom of the structure. The fabricator then laminates the entire assembly together in a press.

18. The fabricator drills vertical through-holes in the multilayer assembly and then plates the through-holes to form vertical conductors between the multiple layers of circuitry patterns (i.e., across one or more layers of the dielectric material separating the individual layers of copper circuitry). These through-holes combine with the conductor paths on the horizontal circuitry planes to create a three-dimensional electronic interconnect system. Any outer layers of copper foil can then be imaged and etched to form the finished multilayer printed circuit board. The completed multilayer board is a three-dimensional interconnect system with electronic signals traveling in the horizontal planes of multiple layers of copper circuitry patterns, as well as the vertical plane through the plated holes.

19. Prepreg is manufactured in a treater, which is a roll-to-roll continuous process machine that sequences specially designed fiberglass cloth or other reinforcement fabric into an epoxy resin tank. The treater then sequences the resin-coated cloth through a series of ovens which partially cure the resin system into the cloth. This partially cured prepreg article is then

sheeted or paneled and then packaged for sale to PCB board manufacturers, or used to construct its laminates.

20. Copper-clad laminates are made in a clean room by first setting up an assembly of one or more plies of prepreg stacked together with a sheet of specially manufactured copper foil on the top and bottom of the assembly. This assembly, together with a large quantity of other laminate assemblies, is then inserted into a large, multiple opening vacuum lamination press. The laminate assemblies are then laminated under simultaneous exposure to heat, pressure and vacuum. After the press cycle is complete, the laminates are removed from the press and sheeted, paneled and finished to customer specifications. Dielectric laminates can be made using a similar process, omitting the copper foil.

21. U.S. Patent No. 6,187,852 ("the '852 patent") titled "Fillers for Improved Epoxy Laminates", and U.S. Patent No. 6,322,885 ("the '885 patent") titled "Talc Particles as Fillers for Improved Epoxy Laminates", issued on February 13, 2001 and November 27, 2001, respectively. The '885 patent is a continuation of the '852 patent, which traces its priority back to U.S. Serial No. 08/620,525 filed on March 22, 1996. The '852 and '885 patents name the same inventors: Aroon Vishwanath Tungare (Arlington Heights, IL); Scott Harold Richgels (Onalaska, WI); Jeffrey Robert Kamla (West Salem, WI); and Peggy Mae Conn (LaCrosse, WI).

22. A copy of the '852 patent is attached as Exhibit 9. A copy of the □885 patent is attached as Exhibit 10.

B. **The Claims.**

23. The □852 patent has 8 method claims, and Isola asserted that at least claims 1-3, 5 and 8 were infringed by TUC in the underlying action. The '885 patent has 9 composition

claims, and Isola asserted that at least claims 1, 2, 4, and 7-9 were infringed by TUC in the underlying action. Claim 1 from each patent is representative and is presented below.

'852 Patent, Claim 1:

> 1. A method of reducing dusting in epoxy resin based laminates during processing of said laminates comprising incorporating in said epoxy resin more than 0 and up to about 20 wt % of talc particles wherein the talc particles have less than about 0.01 wt % water extractable anions and wherein the talc particles are not burnt talc particles.

'885 Patent, Claim 1:

> 1. A laminate for use in printed circuit boards comprising a cured epoxy resin, containing more than 0 and up to about 20 wt % of talc particles wherein the talc particles have less than about 0.01 wt % water extractable anions and wherein the talc particles are not burnt talc particles.

C. **Non-Technical Description of the Patented Inventions.**

24. The '852 and '885 patents are directed to improved epoxy resin-based laminate materials, including prepregs, and methods of making these materials in which an inorganic talc filler is added to the epoxy resin at a level of up to about 20 wt%. The addition of the talc can yield a number of benefits including low thermal expansion in the z-axis direction, low dusting and improved drilling during subsequent PCB fabrication.

25. The following foreign patents correspond to the '852 and '885 patents: EP Pat. No. 0,864,248 (issued July 27, 2005 in Germany, France, Great Britain, Italy, and Sweden) and Taiwan Pat. No. 413659 (December 1, 2000). A corresponding Australian application (No. 25405/97) has lapsed. There are no corresponding pending foreign patent applications that have not already issued as patents.

26. No other foreign patents or patent applications corresponding to the patents in suit have been filed, abandoned, withdrawn, or rejected.

27. Complainant Isola, the assignee of the patents in suit, has granted an implied license to other companies in the Isola family of companies. There are no other licenses to the patents in suit.

V. THE COMMISSION'S ISSUANCE OF A CONSENT ORDER.

28. Isola previously filed an ITC Complaint against, *inter alia*, Respondent TUC on October 6, 2008. Exhibit 3. Isola filed a supplement to the Complaint on October 28, 2008. Exhibit 4. The Complaint and Supplement to the Complaint alleged violations of Section 337 of the Tariff Act of 1930 (19 U.S.C. § 1337) based on the importation into the United States, the sale for importation, and the sale within the United States after importation of certain prepregs, laminates, and finished circuit boards that infringe claims of the '852 patent, the '885 patent, and 6,509,414 ("the '414 patent").[1] Isola did not then identify the Accused Articles as infringing the asserted patents at that time, because on information and belief, the Accused Articles were not fully commercialized in the United States and/or Isola had no knowledge of them being imported into the United States or their composition at that time. The Commission instituted an investigation on November 12, 2008.

29. On March 3, 2009, Isola and TUC filed a Joint Motion to Terminate Investigation Based Upon Consent Order for the remaining patents. An Initial Determination granting the parties' motion for consent order was entered on March 10, 2009. Exhibit 1, Order No. 10, Inv. No. 337-TA-659. On April 10, 2009, the Commission issued notice of its determination not to review the Initial Determination granting the joint motion to terminate the investigation as to TUC based on a consent order. Exhibit 2.

[1] The '414 patent was not asserted against TUC in the underlying action is not at issue in this enforcement complaint.

30. Since the Commission's exclusion order, TUC and/or parties acting in concert with TUC have begun making, using, selling, offering to sell, and/or importing the Accused Articles into the United States. TUC's and/or parties acting in concert with TUC's actions are in direct violation of Administrative Law Judge Charles E. Bullock's Consent Order.

VI. VIOLATION OF THE COMMISSION'S CONSENT ORDER.

31. On information and belief, despite its obligation to comply, TUC has violated the Consent Order, Initial Determination and Commission Determination entered in Inv. No. 337-TA-659 by refusing to cease its unlawful activity.

32. On information and belief, TUC, either alone or in concert with others, manufactures abroad, sells for importation into the United States, imports into the United States, uses and/or sells within the United States after importation, certain prepegs and laminates that are covered by at least claim 1 of the '852 patent, and at least claim 1 of the '885 patent.

33. On information and belief, this activity has occurred, and continues to occur after the dates that the Consent Order, Initial Determination and Commission Determination went into effect in Inv. No. 337-TA-659.

34. TUC's website explains that the infringing articles are made of epoxy resin and are suitable to survive thermal cycles:

> U-862 HF/TU-86P HF Hi-Tg halogen free materials are made of epoxy resin and E-glass fabric. Unlike conventional FR-4 material using brominated resin as flame retardant, TU-862 HF/TU-86P HF achieves flammability class of UL94V-0 by incorporating nitrogen compounds in the materials. The materials are compatible with the AOI process and exhibit the UV-block characteristic. TU-86P HF is designed for use with TU-862 HF for making multilayer printed wire boards. TU-862 HF is also available for single/double sided application. This series of green materials are designed to eliminate the use of halogenated resins due to the potential hazardous effects from the environmental concerns. These articles are suitable for boards that need to survive severe thermal cycles, or to experience excessive assembly work. TU-862 HF laminates also exhibit superior

chemical resistance, thermal stability for lead free soldering assembly and CAF resistance.

Exhibit A to Exhibit 5, Declaration of Saeed Sardar, http://www.tuc.com.tw/PDF/TU-862_HF.pdf.

35. Exemplary claim charts comparing claim 1 of the '852 and '885 patents against the Articles are attached as Exhibits 7 and 8, respectively.

[redacted]

37. [redacted] the Accused Articles contain talc, infringe the patents in suit, and are materially similar to the products that were the subject of Administrative Law Judge Charles E. Bullock's Consent Order. They therefore fall within the scope of the Consent Order, and Respondents' continued importation of the Accused Products is a direct violation of the Consent Order.

VII. SPECIFIC INSTANCES OF VIOLATING THE CONSENT ORDER.

38. On information and belief, TUC and/or parties acting in concert with TUC import, sell for importation and/or sell within the United States after importation, the infringing PCB Materials under the article designation TU-862 HF and TU-86P-HF.

39. The Accused Articles are made available in the United States through at least TUC's website, http://www.tuc.com.tw/. TUC explains: "TUC offers a total solution for PCB manufacturers worldwide - from advanced base materials supply to mass lamination service." The Accused Articles are listed on TUC's site under the "Catalogue" description "Halogen Free."

[redacted]

43. [redacted] Therefore, on information and belief, the Accused Articles

were sold in the United States after being manufactured in Asia and/or imported for sale in the United States.

44. As such, on information and belief, TUC and/or parties acting in concert with TUC are in fact importing and/or causing to be imported into the United States the Accused Articles, in direct violation of Administrative Law Judge Charles E. Bullock's Consent Order.

VIII. RELATED LITIGATION.

45. On June 25, 2012 Isola filed a patent infringement lawsuit against TUC in the United States District Court for the District of Arizona on two patents directed to related technology, United States Patent No. 6,509,414 and United States Patent No. 7,897,258. While the '414 Patent was part of this initial Investigation, it was not made part of the Consent Order with TUC. Isola is unaware of any other court or related proceedings regarding the asserted patents other than the previous Investigation No. 337-TA-659, which resulted in a Consent Order. Exhibit 1.

IX. LICENSES.

46. The asserted patents are/are not subject to any license agreements currently in force. The asserted patents have been/have not been the subject of a license agreement.

X. RELIEF REQUESTED.

47. WHEREFORE, by reason of the foregoing, Isola requests that the United States International Trade Commission:

a) Institute a formal enforcement proceeding, pursuant to 19 C.F.R. Section 210.75, to confirm the violations of the Consent Order described herein;

b) Promptly refer this matter to the Administrative Law Judge for issuance of an Initial and Final Determination on the issues of the enforcement violation and remedy requested;

c) Direct the Administrative Law Judge to (1) issue a supplemental protective order to protect Respondents' confidential business information; (2) permit a necessary and expedited period of fact discovery on TUC and parties acting in concert with it regarding continued violations of the Consent Order; (3) hold a hearing; and (4) issue a Final Determination of Enforcement within four months of initiation of the enforcement proceeding; and

d) After the enforcement proceeding, in the event the Commission determines that there has been a violation of the Commission's Consent Order, issue the following remedies:

i) Issue a permanent cease and desist order pursuant to 19 U.S.C. Section 1337(f) and 19 C.F.R. Section 210.75, prohibiting TUC and parties acting in concert with it from engaging in illegal activities;

ii) Modify the Administrative Law Judge's Consent Order in any manner that would assist in the prevention of the unfair practices that were originally the basis for issuing the Consent Order, or in the detection of any further violations;

iii) Impose civil penalties pursuant to 19 U.S.C. Section 1337(f) that are twice the value of the goods, or $100,000, whichever is greater, for each day the Consent Order is and has been violated, and if necessary, bring a civil

action in an appropriate United States District Court to recover such civil penalties; and

iv) Impose such other remedies and sanctions as are appropriate and within the Commission's authority.

Dated: August 15, 2012.

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VERIFICATION

I, Tarun Amla, am Executive Vice President and Chief Technology Officer for Isola USA Corp. and am duly authorized to sign this complaint on behalf of Isola USA Corp. I have read the complaint and am aware of its contents. To the best of my knowledge, information, and belief, formed after an inquiry reasonable under the circumstances, I hereby certify as follows:

1. The complaint is not being presented for any improper purpose, such as to harass or to cause unnecessary delay or needless increase in the cost of the investigation;

2. The claims and other legal contentions in the complaint are warranted by existing law or by a nonfrivolous argument for the extension, modification, or reversal of existing law or the establishment of new law; and

3. The allegations and other factual contentions in the complaint have evidentiary support or, if specifically so identified, are likely to have evidentiary support after a reasonable opportunity for further investigation or discovery.

I declare under penalty of perjury that the foregoing is true and correct. Executed on August 14, 2012.

Tarun Amla, Executive Vice
President/Chief Technology Officer
Isola USA Corp.