

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:)
)
PETITION OF APEX MATERIAL)
TECHNOLOGIES, LLC FOR AN) AS 2015-002
ADJUSTED STANDARD FROM) (Adjusted Standard – Land)
PORTIONS OF 35 ILL. ADM. CODE)
807.104 and 810.103, OR, IN THE)
ALTERNATIVE, A FINDING OF)
INAPPLICABILITY.)

NOTICE OF FILING

TO: Mr. John Therriault Mr. Bradley P. Halloran
Clerk of the Board Hearing Officer
Illinois Pollution Control Board Illinois Pollution Control Board
James R. Thomson Center James R. Thomson Center
100 W. Randolph Street 100 W. Randolph Street
Suite 11-500 Suite 11-500
Chicago, Illinois 60601-3218 Chicago, Illinois 60601-3218

Michelle Ryan
Division of Legal Counsel
Illinois Environmental Protection Agency
1021 North Grand Avenue East
P.O. Box 19276
Springfield, IL 62974-9276

PLEASE TAKE NOTICE that on this 29th day of December 2014, I have filed with the Office of the Clerk of the Illinois Pollution Control Board the following documents entitled **APEX's Response to Technical Questions of the Illinois Pollution Control Board and Trade Secret Claim Letter** which are attached and herewith served upon you.

Respectfully Submitted,

Apex Material Technologies, LLC

By: /s/ Joseph L. Pellis II
Joseph L. Pellis II

Dated: December 29, 2014

Joseph L. Pellis II
PELLIS LAW GROUP, LLP
901 Warrenville Road, Suite 205
Lisle, IL 60532
t: (630) 442-5500
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CERTIFICATE OF SERVICE

I, Michael J. Tenuto, the undersigned, an attorney, certify that I have served the attached **APEX's Response to Technical Questions of the Illinois Pollution Control Board and Trade**

Secret Claim Letter, upon:

Mr. John Therriault
Clerk of the Board
Illinois Pollution Control Board
James R. Thomson Center
100 W. Randolph Street
Suite 11-500
Chicago, Illinois 60601-3218

via Electronic Filing and via FedEx Express on December 29, 2014; and upon:

Mr. Bradley P. Halloran
Hearing Officer
Illinois Pollution Control Board
James R. Thomson Center
100 W. Randolph Street
Suite 11-500
Chicago, Illinois 60601-3218

via FedEx Express on December 29, 2014; and upon:

Michelle Ryan
Division of Legal Counsel
Illinois Environmental Protection Agency
1021 North Grand Avenue East
P.O. Box 19276
Springfield, IL 62974-9276

via FedEx Express on December 29, 2014.

/s/ Michael J. Tenuto
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December 29, 2014

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VIA FEDEX EXPRESS

Mr. John Therriault
Clerk of the Board
Illinois Pollution Control Board
James R. Thompson Center, Suite 11-500
100 West Randolph Street
Chicago, Illinois 60601

Re: Petition of APEX Material Technologies, LLC
AS 2015-002
Trade Secret Claim Letter

Dear Mr. Therriault,

On August 8, 2014, APEX Material Technologies, LLC (“APEX”) filed its *Petition of APEX Material Technologies, LLC for an Adjusted Standard from Portions of 35 Ill. Adm. Code 807.104 and 810.103, or, in the Alternative, a Finding of Inapplicability*, PCB No. AS 2015-002 (the “Petition”) with the Illinois Pollution Control Board (the “Board”). The Board submitted a series of technical questions to APEX via the Hearing Office Order dated November 24, 2014 (the “Technical Questions”).

In order to fully and accurately respond to the Technical Questions and to give the Board a complete understanding of its contemplated process, APEX has provided certain trade secret information to the Board. Therefore, pursuant to the provisions of Sections 7 and 7.1 of the Environmental Protection Act (the “Act”), 415 ILCS 5/7, 7.1, and 35 Ill. Adm. Code Part 130 (“Part 130”), Petitioner APEX hereby makes a claim for trade secret protection of the entirety of its responses to Technical Questions 5, 12, 13, 14, 15(b), and 22, certain portions of its responses to Technical Questions 3(c), 6, 15(a), 16, 17, and 18, and the entirety of Exhibits 2, 3, 4, 6, 7, 8, and 12. All trade secret information has been marked and filed separately pursuant to the provisions of Part 130.

Mr. John Therriault
APEX Trade Secret Claim Letter
December 29, 2014

The above-referenced responses and exhibits are “trade secrets,” as defined in 415 ILCS 5/3.490 and 35 Ill. Adm. Code 101.202. This letter serves as the claim letter required by 35 Ill. Adm. Code 130.200(b) and triggers the protections from disclosure set forth in Part 130.

A portion of APEX’s response to Technical Question 3(c) and the entirety of Exhibit 2 represent trade secrets. The trade secret portion of APEX’s response to Technical Question 3(c) contains a textual description of the current scientific process utilized by APEX to produce copper oxide, as well as a textual description of the process that APEX would utilize to process copper oxide if the Board were to grant APEX’s Petition. Further, the trade secret portion of APEX’s response to Technical Question 3(c) refers to Exhibit 2. Exhibit 2 contains two process flow diagrams. The first diagram, titled “High Purity Grade (“HPG”) Cupric Oxide Simplified Process,” demonstrates the steps involved in the current process utilized by APEX to produce copper oxide. The second diagram, titled “Copper Ammonium Chloride Simplified Process,” demonstrates the steps that APEX would utilize to produce copper oxide if the Board were to grant APEX’s Petition.

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The entirety of APEX’s response to Technical Question 5 and the entirety of Exhibit 3 represent trade secrets. APEX’s response to Technical Question 5 refers to Exhibit 3. Exhibit 3 is a list of suppliers of used etchant solution that APEX is considering using in its contemplated process. APEX’s supplier list is a part of its overall business plan, has not been published or otherwise disseminated, and has competitive value.

A portion of APEX’s response to Technical Question 6 and the entirety of Exhibit 4 represent trade secrets. The trade secret portion of APEX’s response to Technical Question 6 refers to Exhibit 4. Exhibit 4 contains the protocols and standard operating procedures (“SOP”) in place at APEX for performing the specified named task. The protocols and SOP that comprise Exhibit 4 include: Standard Operating Procedure Filling CuO Drums, Standard Operating Procedure Preparation of High Speed Finishing Solution and AC-CU-Brite Finishing Solution, Loading/Unloading Procedures, Raw Material Profile Form, Standard Operating Procedure for Dryer Shut Down, Standard Operating Procedure Transfer of Scrub to Fresh Building, Standard Operating Procedure Unloading Cupric Tankers, Standard Operating Procedure Westmont Dryer Start-up, and Wet Copper Oxide Packaging.

The entirety of APEX’s response to Technical Question 12 represents a trade secret. APEX’s response to Technical Question 12 is a textual description of the cost of raw materials, labor, and net profitability of APEX’s production of copper oxide utilizing both its current and contemplated processes. APEX’s response to Technical Question 12 also includes information about the cost of raw materials, labor, and net profitability of fresh etch solution.

The entirety of APEX’s response to Technical Question 13 and the entirety of Exhibit 6 represent trade secrets. APEX’s response to Technical Question 13 refers to Exhibit 6. Exhibit 6 is a map of the APEX facility. More specifically, the map details the areas of and equipment contained within APEX’s facility that will be used to process copper ammonium chloride (“CAC”).



Mr. John Therriault
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December 29, 2014

The entirety of APEX's response to Technical Question 14 represents a trade secret. APEX's response to Technical Question 14 refers to Exhibit 4. As described more fully above, Exhibit 4 contains the protocols and standard operating procedures ("SOP") in place at APEX.

A portion of APEX's response to Technical Question 15(a) and the entirety of Exhibit 7 represent trade secrets. The trade secret portion of APEX's response to Technical Question 15(a) refers to Exhibit 7. Exhibit 7 contains letters of interest/intent from four potential customers. More specifically, the letters are addressed to APEX and describe customer interest in both the type and quantity of copper oxide that APEX would be able to produce from its contemplated process.

The entirety of APEX's response to Technical Question 15(b) and the entirety of Exhibit 8 represent trade secrets. APEX's response to Technical Question 15(b) refers to Exhibit 8. Exhibit 8 contains a process flow diagram and a mass balance sheet. The process flow diagram demonstrates the steps involved in the process that APEX would utilize to produce copper oxide and ammonium chloride from CAC. The mass balance sheet describes the mass balance for the aforementioned process.

A portion of APEX's responses to Technical Questions 16, 17, and 18 represents a trade secret. The trade secret portion of APEX's responses to Technical Questions 16, 17, and 18 refers to Exhibit 7. As described more fully above, Exhibit 7 contains letters of interest/intent from four potential customers.

The entirety of APEX's response to Technical Question 22 and the entirety of Exhibit 12 represent trade secrets. APEX's response to Technical Question 22 refers to Exhibit 12. Exhibit 12 is a process flow diagram that details the steps involved in APEX's treatment of the waste stream prior to the stream's discharge to the publicly owned treatment works.

The entirety of APEX's responses to Technical Questions 5, 12, 13, 14, 15(b), and 22, the indicated portions of its responses to Technical Questions 3(c), 6, 15(a), 16, 17, and 18, and the entirety of Exhibits 2, 3, 4, 6, 7, 8, and 12 are "trade secrets" as defined in 415 ILCS 5/3.490 and 35 Ill. Adm. Code 101.202. More specifically, the materials are "scientific or technical information, design, process (including a manufacturing process), procedure, formula or improvement, or business plan which is secret in that it has not been published or disseminated or otherwise become a matter of general public knowledge, and which has competitive value." 415 ILCS 5/3.490; 35 Ill. Adm. Code 101.202. Thus, APEX claims trade secret protection for the entirety of its responses to Technical Questions 5, 12, 13, 14, 15(b), and 22, the indicated portions of its responses to Technical Questions 3(c), 6, 15(a), 16, 17, and 18, and the entirety of Exhibits 2, 3, 4, 6, 7, 8, and 12.

APEX will provide a statement of justification upon request pursuant to 35 Ill. Adm. Code 130.201.



Mr. John Therriault
APEX Trade Secret Claim Letter
December 29, 2014

Enclosed is a copy of each exhibit marked as provided in 35 Ill. Adm. Code 130.302.

Should you have any questions, please do not hesitate to contact me directly at (630) 442-5505 or via email at jpellis@pellislaw.com.

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Very truly yours,

PELLIS LAW GROUP, LLP



Joseph L. Pellis II

JLP/mjt
Enclosures



BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:)
)
PETITION OF APEX MATERIAL)
TECHNOLOGIES, LLC FOR AN) AS 2015-002
ADJUSTED STANDARD FROM) (Adjusted Standard – Land)
PORTIONS OF 35 ILL. ADM. CODE)
807.104 and 810.103, OR, IN THE)
ALTERNATIVE, A FINDING OF)
INAPPLICABILITY.)

**APEX’S RESPONSE TO TECHNICAL QUESTIONS OF
THE ILLINOIS POLLUTION CONTROL BOARD**

Petitioner, APEX Material Technologies, LLC (“APEX”), by and through its attorneys, Pellis Law Group, LLP, provides this response to the Illinois Pollution Control Board’s (the “Board”) technical questions submitted to APEX via the Hearing Officer Order dated November 24, 2014. APEX’s response to the Board’s technical questions is in further support of its petition for a finding of inapplicability or, in the alternative, for an adjusted standard from portions of 35 Ill. Adm. Code Sections 807.104 and 810.103. For the sake of clarity, APEX restates and responds in bold print to each of the Board’s twenty-five (25) numbered paragraphs as follows:

Test Results for Hazardous Waste Characteristics

1. The petition states that copper-rich "used etchant solution" or "copper ammoniumchloride etchant (CAC)" "is not classified as a solid waste or a hazardous waste for regulatory purposes. CAC has a pH of 8 to 9 and never exhibits characteristics of corrosivity or toxicity. To confirm this fact, APEX recently performed analytical tests, including TCLP and pH, on a representative sample of CAC. The test results demonstrate CAC's non corrosive and non-hazardous properties. Attached as Exhibit I are the test results." Pet. at 7.

Exhibit I contains a table entitled "Analytical Test Results" and a laboratory report from First Environmental Laboratories, Inc. Concentrations of the contaminants included in Exh. I that appear under the federal hazardous waste rules at 40 CFR 261.24 Toxicity characteristic are: cadmium, chromium, and lead. The table states, "No other TCLP metals were analyzed as they are not used nor present at the processing facilities." Exh. I. Exhibit I does not

indicate the test method used.

- a. Indicate the method or methods that were utilized to obtain the results reported in Exhibit I and if the methods are consistent with the test methods under 35 Ill. Adm. Code 721.124.

APEX RESPONSE:

The methodology utilized by First Environmental Laboratories, Inc. ("First Environmental") was consistent with Method 1311 (Toxicity Characteristic Leaching Procedure ("TCLP")) in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," USEPA publication number EPA 530/SW-846, as incorporated by reference in 35 Ill. Adm. Code 720.111(a). The methods used to determine lead and hexavalent chrome are 3060A/7196A and 6010C, respectively.

APEX requested that First Environmental test the CAC for the TCLP metals lead and hexavalent chrome. Cadmium was determined by APEX's internal lab using method 7000B. pH was determined by APEX's internal lab consistent with Method 1311.

- b. Provide test results for the used etchant solution from an independent Illinois EPA certified lab for each supplier APEX is currently considering to demonstrate whether the used etchant solution exhibits any of the characteristics of hazardous waste identified in 35 Ill. Adm. Code 721.121 Characteristic of Ignitability, 721.122 Characteristic of Corrosivity, 721.123 Characteristic of Reactivity, or 721.124 Toxicity Characteristic. For the toxicity characteristic, provide test results for the full suite of contaminants listed in 35 Ill. Adm. Code 721.124(b) [40 CFR 261.24] using Method 1311 in "Test Methods for Evaluation Solid Waste, Physical/Chemical Methods."

APEX RESPONSE:

The representative test results submitted as Exhibit I to APEX's Petition were conducted by First Environmental Laboratories, Inc., 1600 Shore Rd., Naperville, IL 60563. First Environmental is an IEPA and National Environmental Laboratory Accreditation Program (NELAP) certified laboratory with Accreditation Number 100292.

See APEX's Response to Question 1(a), *supra*, regarding the testing performed by First Environmental.

With respect to initial testing of the CAC from all new customers, APEX proposes to have First Environmental perform a comprehensive analysis for Ignitability,

Corrosivity, Reactivity and Toxicity pursuant to Illinois regulations. This testing would be performed pre-shipment.

After this initial testing was performed by First Environmental, APEX would then test every subsequent load of CAC from that customer utilizing its own internal laboratory to verify the chemical composition of the CAC. Once the CAC arrives at the APEX facility, and before any lot is placed into process, it will be tested again as an additional quality control measure.

For subsequent CAC deliveries from existing customers, APEX would also rely upon the customer certifications that they had inspected the CAC, and that the process that generated the CAC had remained consistent from all prior shipments. Any changes in process would require the same comprehensive testing initially conducted by First Environmental. A copy of APEX's proposed contract with its customers is attached hereto as Exhibit 1.

Regarding the inquiry about testing for the "full suite" of TCLP contaminants, and as noted above, APEX would have First Environmental perform such comprehensive testing for all new customers. For subsequent shipments, APEX proposes to use its in-house lab to test only for those substances that APEX believes might have a reasonable scientific probability for being present in the CAC. This belief is based upon APEX's knowledge of the processes that generated the CAC material at the customer's location.

Every six months, and in order to validate both the customer certifications and its in-house testing, APEX proposes to send representative samples for all customers to First Environmental for a comprehensive analysis for Ignitability, Corrosivity, Reactivity and Toxicity pursuant to Illinois regulations.

APEX believes that the foregoing testing protocol – initial testing by First Environmental, coupled with subsequent testing of every load, coupled with the customer certifications, and validation testing every six months, provides a comprehensive level of quality assurance and quality control that should satisfy both the Board and IEPA.

2. Exhibit I states, "All inbound Spent Etchant will be analyzed regularly and routinely by Apex Material Technologies' internal lab prior to processing. Apex will also use this independent IL EPA certified lab to analyze inbound Spent Etchant materials for TCLP metals prior to processing. Apex Material Technologies will use this IL EPA Certified lab to qualify samples of spent etchant from all". Exhibit I. The end last sentence above appears to have been cut off. Please address whether there should be more.

APEX RESPONSE:

APEX apologizes that the last few lines of Exhibit I were inadvertently omitted. The omitted lines should read, "Apex Material Technologies will use this IL EPA Certified lab [First Environmental] to qualify samples of spent etchant from all customers on an initial basis and additionally on a bi-annual basis to test the incoming CAC material and as a back check against internal Apex testing. Apex internal testing will be done on a systematic basis on all incoming CAC."

Also of note, the APEX in-house lab has the same or similar capabilities and utilizes the same scientifically approved methodologies as First Environmental. While the APEX lab is not currently NELAP accredited, as we move forward APEX will consider obtaining its NELAP certification and bringing all of the pre-shipment testing in-house, while maintaining the validation testing as currently proposed.

Non-Solid Waste Determination under Hazardous Waste Rules

3. Exhibit O of the petition is a letter from USEPA Region 5 regarding Heritage Environmental Services, Inc. stating, "spent etchants may occasionally exhibit the toxicity characteristic (TC) for several TC metals." Exhibit O at 2. USEPA goes on to find; "the Region believes that the acid etchant solution meets the criteria for use/reuse exclusion specified at 40 CFR 261.2(e). It is our opinion that the acid etchant is not a RCRA solid waste (and thus not a RCRA hazardous waste), when this waste is wholly utilized in the Heritage process (40 CFR 261.1(c)(5)(i)). . . In summary, the Region supports the State's determination that the production of the Heritage copper salt is consistent with the RCRA use/reuse exclusion. . ." Exhibit O.

In Exhibit O, USEPA considers the "spent etchants" under the 40 CFR Part 261 hazardous waste regulations. Exhibit M indicates the Indiana Department of Environmental Management also considered recycling of the "Copper containing secondary materials" to be exempt under the federal hazardous waste regulations 40 CFR 261.2(e). Exhibit P indicates the Commonwealth of Virginia also considered "spent printed circuit board etchant solutions" for the exclusion under the hazardous waste regulations. Similarly, Exhibit Q indicates the State of Colorado considered "spent copper etch" under the hazardous waste regulations.

Exhibits O, M, P and Q all relate to Heritage Environmental Services (HES). The petition states, "HES's process is substantially similar to the process proposed by APEX." Pet. at 18.

- a. Please explain why Heritage Environmental Services sought the exclusion under the hazardous waste regulations while APEX has not.

APEX RESPONSE:

APEX cannot speak for, nor explain why Heritage Environmental Services sought the exclusion under the hazardous waste regulations, as APEX was not involved in any of these discussions or determination. Nevertheless, it is APEX's understanding that Heritage sought the exclusion because its predecessor company, Phibrotech, originally classified the CAC material as a hazardous waste in order to keep competition out of this market, and it was easier for them to argue the use/reuse exclusion under their existing RCRA permit.

From APEX's perspective, it does not consider the CAC material to be hazardous in the first instance. As the test results demonstrate, the CAC material does not qualify as high or low pH as Micronutrients is putting on their MSDS's. In addition, and as APEX has pointed out several times, the CAC material is currently being shipped across Illinois roads and highways via Bills of Lading and not as a hazardous waste. Further, Micronutrients has qualified the CAC material as non-hazardous and uses the exact same CAC material in animal feed. Accordingly, APEX believes that the CAC material should not be categorized as a hazardous waste for regulatory purposes.

- b. Please explain how the used etchant solution APEX plans to purchase is different from that in the Heritage Environmental Services situation.

APEX RESPONSE:

The used etchant solution APEX plans to purchase is exactly the same as Heritage Environmental Services purchases. The only difference is in the end product. Heritage, (Micronutrients) uses it to make animal feed. The product is used to make Tri-Basic Cupric Chloride. Apex will use it to make copper oxide and fresh etchant.

- c. Exhibit L is a letter from Illinois EPA dated June 9, 2014, finding, "The reclamation of the spent copper ammonium chloride etchant prior to use as a raw material or product is a regulated waste treatment activity." Exhibit L at 2. The petition states, "The APEX process does not remove any contaminants from the used etchant solution. Rather, the APEX process simply separates the ammonia-based etchant from the residual copper." Pet. at 14. Please clarify whether the CAC is reclaimed prior to being used as an ingredient in the production of fresh etchant solution or if it is directly used as an ingredient. *See* 35Ill. Adm. Code 720.131 regarding the requirement for reclamation for a non-solid waste determination under the hazardous waste rules.

APEX RESPONSE:

APEX does not believe that its proprietary process necessarily fits within the regulatory definition of "recycling, reclamation or reuse" of the CAC material as those terms are generally used. 415 ILCS 5/3.380. As pointed out in its Petition and Reply papers, the

APEX process does not “remove any contaminants from a waste” nor does it process “materials that would otherwise be disposed of or discarded.” Accordingly, the APEX process is not technically “recycling, reclamation or reuse” under Illinois regulations.

As APEX has pointed out, both this Board and the Illinois Supreme Court have consistently ruled that a material, like CAC, that is “destined to be reused” is not a “waste” in the first instance.

APEX’s further response to Question 3(c) constitutes trade secret information. Thus, APEX’s further response, which includes Exhibit 2, has been filed separately pursuant to 35 Ill. Adm. Code Part 130.

4. According to Exhibit I, the chromium (total) concentration in the samples from Midwest Printed Circuits and Galaxy Circuits is 29 mg/L and 41 mg/L, respectively. The maximum concentration of contaminants for the toxicity characteristic under the hazardous waste rules for chromium is 5.0 mg/L. *See* 35 Ill. Adm. Code 721.124(b), 40CFR 261.24.
 - a. Please explain why APEX did not consider the used etchant solution as a characteristic hazardous waste pursuant to Part 721 and proceed under non-solid waste determination under 35 Ill. Adm. Code 720.131.

APEX RESPONSE:

APEX’s position is that the CAC material is neither a “solid waste” nor a “hazardous waste” in the first instance. In addition, the criterion for a Solid Waste Determinations under 35 Ill. Adm. Code 720.131 do not appear to apply to the CAC. APEX is not “accumulating speculatively” the CAC as required in 35 Ill. Adm. Code 720.131(a). APEX is not “reusing [the CAC] as feedstock within the original production process” as required in 35 Ill. Adm. Code 720.131(b). And lastly, the CAC, once processed is not “commodity-like” and does not need “to be reclaimed further” as required in 35 Ill. Adm. Code 720.131(c).

In addition, the chromium identified in the CAC material is trivalent chrome (“Cr(III)”), not hexavalent chrome (“Cr(VI)”). The regulatory level of Chromium stated in 35 Ill. Adm. Code 721.124(b) does not differentiate between the different types of Chromium. Micronutrients is currently using 100% the Cr(III) chromium found in the CAC as an ingredient in its animal feed, and none of the Cr(III) is removed by the Micronutrients process. If Cr(III) from the CAC material is allowed to go directly into our food stocks, it would follow that Cr(III) going into an industrial application should be less of a concern from an environmental regulatory perspective.

According to a USEPA study:

Cr(III) potentiates the action of insulin in peripheral tissue and is essential for animals and humans. Adults in the United States are estimated to ingest approximately 60 µg/day of chromium from food (ATSDR, 1993). NRC has

identified an ESADDI for chromium of 50-200 µg/d (NRC, 1989), corresponding to 0.71-2.9 µg/kg/day for a 70 kg adult. FDA has selected a Reference Daily Intake for chromium of 120 µg/d (U.S. DHHS, 1995).

<http://www.epa.gov/iris/toxreviews/0028tr.pdf>

As such, APEX's position is that Cr(III) is an essential element in nature, and to some extent essential to human life. As such, APEX believes that the levels of Cr(III) found in the representative samples of two potential customers are not, and should not be considered, a significant cause for concern as the APEX process is sufficiently protective to human health and the environment.

- b. If further testing in accordance with Question I(b), above; indicates that used etchant solution is a characteristic hazardous waste, please comment on whether a non-solid waste determination under 35 Ill. Adm. Code 720.131 would be the appropriate relief mechanism for APEX.

APEX RESPONSE:

As stated above, APEX's position is that the CAC material is neither a "solid waste" nor a "hazardous waste" in the first instance. Nevertheless, if this Code section were to apply, APEX is essentially proceeding with the same analysis and criterion that the Board would conduct and consider to grant APEX's Petition for relief under a Solid Waste Determination per 35 Ill. Adm. Code 720.131(c).

In addition, as APEX stated in its Reply papers, before the CAC can be listed as hazardous, an analysis of the criterion for listing a hazardous waste under 35 Ill. Adm. Code 721.111(3)(A)-(K) must be conducted. APEX believes that a thorough analysis of the eleven (11) factors listed in 35 Ill. Adm. Code 721.111(3)(A)-(K) would demonstrate that the CAC is not hazardous in the first instance. For example, there is no evidence that CAC poses any threat to human health or the environment, nor a single instance that any improper management of CAC has caused any such harm or damage. Further, as the Board and IEPA are well aware, USEPA and other states have granted use/reuse exemptions for CAC to Micronutrients, based, in part, on the fact that CAC does not pose a substantial threat to human health or the environment. See 35 Ill. Adm. Code 721.111(3)(I)-(J)

Nevertheless, APEX could anticipate some customers' CAC material having some constituents that could potentially fall within the technical definition of a characteristic hazardous waste as defined under Illinois regulations, such as the Cr(III) as noted above. In addition, APEX would anticipate that the copper metal within the CAC may have some elevated levels of lead (Pb) and Cadmium (Cd). Despite this, APEX believes that the CAC material is still viable as a raw material feed for its process as described in the submitted documentation, and is exempt from regulation. Furthermore, there is no apparent downside to the APEX process when potential trace metals are present at "reasonable" levels. APEX believes that any TCLP metals that may be present in the

CAC at certain levels would have no significant impact on its CAC processing activity, nor will it represent a potential for release to the environment through its normal operations.

As noted herein, APEX believes its QA/QC testing procedures will filter out and reject any proposed CAC that is truly “hazardous” or contains any “foreign substances” that APEX would not anticipate being a normal constituent within the CAC. In addition, as a further quality control measure, APEX monitors its waste water stream very carefully, and also performs semi-annual waste water analyses in which the full suite of TCLP metals are analyzed. APEX is confident that this additional safety measure will result in the waste water generated in its process to be well below the characteristic levels specified for hazardous waste, despite processing the CAC material that might contain higher trace levels of certain TCLP metals.

To place a finer point on this issue, APEX will reject any proposed CAC material that it believes should be characterized as a “hazardous waste” or is a significant threat to human health or the environment.

Accordingly, APEX believes that an analysis under both 35 Ill. Adm. Code 720.131(c) and 35 Ill. Adm. Code 721.111(3)(A)-(K) would yield the same results – that the CAC material is neither a “solid waste” nor a “hazardous waste” that is subject to regulation.

Quality Control Over Used Etchant Solution Purchased

5. Exhibit G, App. C, Exhibit C includes testing from three sources: ITO Industries, Midwest Printed Circuits, and Galaxy Circuits. Please provide a list of all potential suppliers APEX is considering.

APEX RESPONSE:

APEX’s response to Question 5 constitutes trade secret information. Thus, APEX’s response, which includes Exhibit 3, has been filed separately pursuant to 35 Ill. Adm. Code Part 130.

6. Provide documentation that all of the parties involved will have sufficient control over the materials to preclude unknown contamination from entering into the materials.

APEX RESPONSE:

See APEX’s Response to Question 1(b), *supra*.

APEX’s further response to Question 6 constitutes trade secret information. Thus, APEX’s further response, which includes Exhibit 4, has been filed separately pursuant to 35 Ill. Adm. Code Part 130.

7. On page 6 regarding QA/QC, the petition states, "APEX will purchase the CAC from various circuit board manufacturers and will require each Customer to sample, profile, and certify that the material APEX is purchasing meets its specifications, and is free from hazardous waste or hazardous materials."
 - a. Please clarify whether "sample and profile" means to obtain a representative sample of the CAC and have it tested by an Illinois EPA certified lab pursuant to TCLP Method 1311.

APEX RESPONSE:

See APEX's Response to Question 1, *supra*.

In summary, APEX plans on conducting the following actions:

- 1. All new customers will first have a pre-shipment sample sent to a third party lab (First Environmental) for a comprehensive analysis and qualification. "Sample and Profile" means APEX will obtain a representative sample of the CAC and test for the following: Copper content, pH, Ignitability, Corrosivity, Reactivity and Toxicity (TCLP metals).**
 - 2. All subsequent samples will be analyzed by APEX's in-house lab. On the TCLP metals, APEX will only test for those constituents that it has reason to believe might be in the CAC material.**
 - 3. Once the CAC arrives at the APEX facility, it will be tested once before it is accepted and placed into the process as an additional quality control measure.**
 - 4. Every six months APEX will requalify both the customer certifications and its own in-house testing by shipment of samples to First Environmental.**
- b. Please explain whether the "specifications" for CAC are established based on the copper content of the material or on the basis of TCLP limits under Part 721. If specifications only address copper content, please comment on whether the applicable TCLP limits for other constituents listed in Part 721 should be added to the CAC specifications.

APEX RESPONSE:

The "specifications" for the CAC are based on 2 factors:

1. The CAC has at least a minimum amount of copper in it.
2. The CAC is non-hazardous and does not pose any threat to APEX employees, its customers, human health, or the environment.

Should either of these two factors fail to meet the specifications, then the material will not be accepted for delivery.

- c. Please clarify whether APEX is proposing a copper content in the range of 10- 20% by weight listed in MSDS (Exhibit G, Appendix B) as the acceptable specification for CAC. If so, please comment on the rationale for choosing the 10–20 % copper content as the acceptable range considering that the analytical results (Exhibit G, Appendix C) indicate that copper content to be in the range of 10 - 13 % by weight.

APEX RESPONSE:

The 10% - 20% range appearing in the MSDS simply reflects the typical range at which the copper level in CAC will be when it is being considered for delivery to APEX. APEX is prepared to accept CAC with a copper concentration lower than 10% and higher than 20%; however, we would anticipate these instances to be rare.

- d. Please comment on whether the CAC specifications must be included as a condition in the Board Order, if APEX's petition is granted by the Board. If so, propose language for the Board Order prescribing the specifications for CAC that set forth the minimum copper content, and demonstrate that CAC is not a hazardous waste. See Question 25.

APEX RESPONSE:

See APEX's Response to Question 25, *infra*.

8. The petition states, "APEX will maintain a Profile Sheet that sets forth certain specifications for the CAC... APEX will require each customer to semi-annually recertify its adherence to the Profile Sheet. Pet. at 6. Exhibit G is provided for proposed customer Galaxy Circuits, Inc.
 - a. Please clarify if the Profile Sheet would be the same for all customers, and if not, how it would change.

APEX RESPONSE:

Yes, the Profile Sheet would be the same for all customers.

- b. Please clarify whether the semi-annual recertification required by APEX would require customers sample and test CAC to demonstrate compliance with APEX's specifications. Also comment on whether the proposed semi-annual certification requirement must be included as a

condition of granting APEX's request. If so, please propose language for inclusion in the Board Order. See Question 25.

APEX RESPONSE:

The semi-annual recertification is designed as an independent check on APEX's on-going in-house testing protocol. APEX would have no objection to the Board including this recertification as a condition to granting APEX's request as this was an integral part of its plans from the beginning.

9. On page 7, the petition states, "[a]s an additional quality control measure, APEX will also sample the incoming materials to verify that the CAC matches the Material Safety Data Sheets ("MSDS") provided by each Customer."
 - a. Please clarify whether incoming CAC from each customer would be sampled and analyzed on a daily basis. If not, please address the frequency of testing of incoming CAC.

APEX RESPONSE:

See APEX's Responses to Question 1 and Question 7(a), *supra*.

Additionally, each lot will be tested before it is placed into production to verify that it is consistent with the specifications.

- b. Please list the chemical constituents in the MSDS (Petition Exhibit G) for which the daily samples will be analyzed by APEX. In addition, to the constituents in the MSDS, please comment on whether the samples of incoming CAC will be analyzed for any constituents with TCLP limits specified under Part 721.

APEX RESPONSE:

See APEX's Response to Question 1, *supra*.

In a normal course of business, APEX qualifies all suppliers of all raw materials. Regarding TCLP testing of the CAC material, as noted above, APEX will test for constituents of concern that it knows, based upon its experience in this area, could potentially be problematic at the customer side and might be found in the raw material. The full spectrum of TCLP would be run if APEX has reason to believe that certain constituents of concern might exist in the CAC material after the initial testing was performed by First Environmental. If the customer continues to certify after initial testing that the process by which the initial lot of CAC was produced has changed, then APEX will only test a limited suite of TCLP. Also as noted above, the full suite of TCLP will be run by First Environmental every six months to confirm initial testing.

- c. Please comment on whether the sampling of incoming CAC must be included as a condition of granting APEX's petition. If so, propose language for condition requiring ongoing sampling of incoming used etchant solution. See Question 25.

APEX RESPONSE:

APEX has no objection to the Board including the sampling protocols detailed herein as a condition to granting APEX's Petition, as this was an integral part of APEX's initial plan.

10. Does used etchant solution have a shelf life? If so, please address what APEX would do with used etchant solution whose shelf life has expired.

APEX RESPONSE:

With the exception of the ammonia in the CAC material volatilizing, the remainder of the constituents in the CAC do not have a shelf-life. As such, if the CAC material is properly sealed, then APEX would not expect any volatilization to occur and as a result, the material would not have a traditional shelf-life.

In addition, APEX does not anticipate storing the CAC at its facility for any significant length of time to allow for volatilization to occur to any substantial degree.

Further, Exhibit 5 is a letter that explains the shelf life of CAC. The letter is directed to APEX from an individual, Jerome W. Cassata, who participated in the engineering, design, construction, and operation of CAC operations at APEX's facility from 1973 to 2000.

11. Address whether the used etchant solution may be reused over and over again through the APEX process indefinitely or if there is a limit to how many times it can be separated?

APEX RESPONSE:

The CAC material that APEX will purchase from its customers is never "reused over and over again through the APEX process." Once the CAC is separated via the APEX process, two new products are created and sold out into the stream of commerce.

Upon information and belief, Micronutrients and Phibrotech and been reprocessing the materials for over 20 years without incident.

Further, Exhibit 5 also addresses the re-use of CAC.

Value of Used Etchant Solution Before Processing

12. The petition states the "value of the spent etchant exceeds the value of the fresh etchant due to the value of the copper that APEX will separate from the used etchant solution." Pet. at 11. Please provide information to support this statement. If necessary, petitioner may file such information under the Trade Secret provision of the Board's rules.

APEX RESPONSE:

APEX's response to Question 12 constitutes trade secret information. Thus, APEX's response has been filed separately pursuant to 35 Ill. Adm. Code Part 130.

13. The petition states, "APEX plans to spend upwards of \$1 million or more on upgrading its existing infrastructure to properly process the CAC material." Pet. at 4. Exhibit B is "a map showing segregated areas at the APEX facility that will be used for the incoming material [used etchant solution]". Pet. at 3. The Petition states, "Exhibit E is a complete inventory listing of all proposed equipment and other infrastructure improvements associated with this program." Pet. at 5. Please provide a larger copy of Exhibit B such that the proposed equipment and improvements listed in Exhibit E (marked as Trade Secret) can be more clearly discerned.

APEX RESPONSE:

APEX's response to Question 13 constitutes trade secret information. Thus, APEX's response, which includes Exhibit 6, has been filed separately pursuant to 35 Ill. Adm. Code Part 130.

14. Describe how APEX will handle used etchant solution to minimize loss?

APEX RESPONSE:

APEX's response to Question 14 constitutes trade secret information. Thus, APEX's response, which includes Exhibit 4, has been filed separately pursuant to 35 Ill. Adm. Code Part 130.

15. The petition on page 5 states, "[t]he "used etchant solution once processed, is sold directly back to the original Customers for use in the same process that originally produced the CAC."
 - a. Please clarify whether an "original" customer who supplies certain amount of spent etchant to APEX will be required to purchase the same amount of processed "used etchant solution" to maintain the "closed" loop.

APEX RESPONSE:

See Exhibit 1, which is a copy of APEX's proposed contract with its customers.

APEX's further response to Question 15(a) constitutes trade secret information. Thus, APEX's further response, which includes Exhibit 7, has been filed separately pursuant to 35 Ill. Adm. Code Part 130.

- b. If not, does APEX collect and mix used etchant solution from a variety of customers and sell the fresh etchant solution without regard to origin?

APEX RESPONSE:

Yes, APEX anticipates instances where certain customers' CAC material would be comingled for a short period of time prior to processing at the APEX facility.

APEX's additional response to Question 15(b) constitutes trade secret information. Thus, APEX's response, which includes Exhibit 8, has been filed separately pursuant to 35 Ill. Adm. Code Part 130.

- c. Please address whether APEX would receive used etchant solution directly from the facility producing it or if APEX would ever receive it through an intermediary.

APEX RESPONSE:

APEX will receive CAC directly from the customer's facility producing it. APEX has no plans to purchase CAC from any intermediary at this time. Nevertheless, it is theoretically possible that APEX could contract through an intermediary or broker for the purchase of the CAC. In that case, APEX would go through the exact same qualification protocol as described herein. Both the intermediary and its client would have to be qualified just like any other customer, and APEX would employ the same testing and QA/QC process as it plans to employ when purchasing the CAC directly from its customers.

16. Please explain if used etchant solution will be accumulated at the APEX facility speculatively.

APEX RESPONSE:

APEX will not accumulate any CAC material speculatively. All customers will sell CAC to APEX for processing with the specific understanding and agreement that they will be purchasing fresh etchant solution back from APEX, thus creating the "closed loop" system.

The second product created from the APEX process, Copper Oxide has a very

large and established market that is currently under-served at time, and is in great demand.

APEX's further response to Question 16 constitutes trade secret information. Thus, APEX's further response, which includes Exhibit 7, has been filed separately pursuant to 35 Ill. Adm. Code Part 130.

Market for Fresh Etchant Solution and Copper Oxide

17. The petition states, "APEX will also sell the ammonium chloride as 'fresh etchant solution' back to the original Customers to use in the same process that originally produced the 'used etchant solution.'" Pet. at 2. Please provide evidence that a market for APEX's proposed fresh etchant solution exists. For example, provide preliminary contracts or letters of interest between APEX and various customers illustrating a willingness to purchase the fresh etchant solution made from the used etchant solution and under what circumstances.

APEX RESPONSE:

See APEX's Response to Question 16, *supra*.

See also Exhibit 1, which is a copy of APEX's proposed contract with its customers.

APEX's further response to Question 17 constitutes trade secret information. Thus, APEX's further response, which includes Exhibit 7, has been filed separately pursuant to 35 Ill. Adm. Code Part 130.

18. The petition states, "APEX will then sell the copper oxide as a product into the pigment, frit, and/or micronutrient industries." Pet. at 2. Please provide evidence that a market for APEX's proposed "copper oxide" exists. For example, provide preliminary contracts or letters of interest between APEX and various customers illustrating a willingness to purchase the copper oxide made from the used etchant solution and under what circumstances.

APEX RESPONSE:

See APEX's Response to Question 16, *supra*.

See also Exhibit 1, which is a copy of APEX's proposed contract with its customers.

APEX's further response to Question 18 constitutes trade secret information. Thus, APEX's further response, which includes Exhibit 7, has been filed separately pursuant to 35 Ill. Adm. Code Part 130.

19. The petition states, "Attached as Exhibit J are the Bills of Lading/Shipping Manifests currently used by the Customers to transport the CAC material." Pet. at 7. Each form in Exhibit J lists an "offerer" and a "designated facility", including Micronutrients of Indianapolis, IN; Ampel, Inc. of Elk Grove Village, IL; General Circuits of Elk Grove Village, IL; and Star Acquisitions of Elk Grove, IL. The US DOT description is "RQ UN3266, Corrosive Liquid, Basic, Inorganic, N.O.S. 8, PGII, (Ammonium Hydroxide, Ammonium Chloride), ERG#154". Exhibit J.
- a. Please clarify if the Bills of Lading/Shipping Manifests are for used etchant solution, fresh etchant solution, or the copper oxide.

APEX RESPONSE:

Exhibit 9 is a Bill of Lading for used etchant solution. Exhibit 10 is a Bill of Lading for fresh etchant solution. Exhibit 11 is a Bill of Lading for copper oxide.

- b. Please clarify if APEX considers the facilities identified in Exhibit J as potential customers for its proposed fresh etchant solution and/or copper oxide products.

APEX RESPONSE:

Yes, APEX would consider each "offerer" listed in Exhibit J as a potential customer.

Environmental Concerns

20. If the used etchant solution were not purchased by APEX and instead disposed of as waste, please describe how it would be disposed of.

APEX RESPONSE:

APEX is unaware of any CAC that is disposed of as waste. It is our understanding that for at least the last 20 years this CAC material has been sold to Micronutrients in Indiana or Phibrotech in California and processed into chicken feed and fresh etchant solution.

21. Please address whether APEX's facility for used etchant solution would retain more characteristics of a "recycling center" [415 ILCS 5/3.375] than a "pollution control facility" [415 ILCS 5/3.330].

APEX RESPONSE:

APEX does not believe that its facility would fall into either definition. The APEX facility is not designed, nor intended to be, a "waste storage site, sanitary landfill, waste disposal site, waste transfer station, waste treatment

facility, or waste incinerator.” As such it is not a “pollution control facility.” If forced to choose, the APEX facility would appear to have more characteristics of a recycling center as that term is defined by 415 ILCS 5/3.375, as the CAC it seeks to process may be considered a “nonhazardous, nonspecial, homogeneous, nonputrescible material.” Regardless, and simply stated, the APEX facility is a manufacturing plant.

22. On page 3, the petition states, "As demonstrated in the Process Flow Diagram and Material Balance (Exhibit A), the APEX process uses 100% of the incoming CAC material, and will not result in any adverse impact on human health or the environment." Exhibit A indicates that APEX's process results in the brine waste stream that accounts for 52 percent by weight of the process inputs. Please elaborate on the on-site treatment of brine wastewater provided by APEX prior to its discharge to the POTW. Does this treatment generate any other waste stream or sludge? If so, please comment on how any wastes generated by on-site treatment will be managed by APEX.

APEX RESPONSE:

APEX's response to Question 22 constitutes trade secret information. Thus, APEX's response, which includes Exhibit 12, has been filed separately pursuant to 35 Ill. Adm. Code Part 130.

23. On page 5, the petition states, "APEX also utilizes an HPG dust collector. The dustcollector uses high temperature, pleated cartridge filters to capture HPG fines generated from an HPG dryer."
- a. Please clarify whether HPG stands for "high pressure gravimetric".

APEX RESPONSE:

HPG stands for High Purity Grade.

- b. Please comment on whether upgrading infrastructure to process CAC material increase the emission of HPG fines. If so, would such an increase in emissions require upgrading of dust collector and scrubbers?

APEX RESPONSE:

Although emissions would increase from current production levels, APEX believes that the capacity of its current emission control equipment would be more than sufficient to handle the increased emission volume. APEX does not anticipate having to upgrade its dust collector and scrubbers, however, APEX will monitor the efficiency of its emission control equipment and should upgrades be necessary, then APEX will proceed to upgrade accordingly.

Proposed Conditions

24. APEX proposed conditions of an adjusted standard relief. Pet. at 22-23. Please consider proposing conditions for the used etchant solution to not be considered a waste.
25. Please comment on including the following conditions of any relief granted:

The Board finds that the used etchant solution or copper ammonium chloride etchant (CAC) that APEX processed at its facility on 10 Industry Avenue, Joliet, Will County, to produce fresh etchant solution and copper oxide is not a waste under the following conditions.

1. For purposes of this order, "used etchant solution" or "copper ammonium chloride etchant (CAC)" is defined as used "ammonium chloride etchant solution" that is used to strip away excess copper from printed circuit boards.

AGREED.

2. APEX must not use used etchant solution or CAC which is characteristic hazardous waste, or contain a listed hazardous waste, asbestos or PCBs. APEX must reject and return a load to the supplier if it finds that the used etchant solution exhibits a characteristic of hazardous waste or contain a listed hazardous waste, asbestos or PCBs.

AGREED, but with the caveat as discussed in APEX's Responses to Questions 4(a) and 4(b), *supra*, regarding Cr(III), Cd, and Pb, and as set forth in the Product Specification table below.

3. APEX must use only used etchant solution or CAC that meets the following specifications:

PRODUCT SPECIFICATION

Spent Etchant

Parameter	Unit	Range
Copper, as Cu	wt%	7 - 20
Iron, as Fe	wt%	0.05 max.
Zinc, as Zn	wt%	0.2 max.
Arsenic, as As	ppm	< 5.0
Cadmium, as Cd	ppm	<1.0 – 5.0

Chromium (VI+), as Cr (VI+)	ppm	< 5.0
Lead, as Pb	ppm	<5.0 – 50.0
Mercury, as Hg	ppm	< 0.2
Selenium, as Se	ppm	< 1.0
Silver, as Ag	ppm	< 5.0
pH		8 - 10.5

Appearance: Clear, dark green liquid, free of suspended matter.

4. APEX must operate the facility in compliance with all applicable provisions of the Environmental Protection Act.

AGREED.

5. APEX must maintain a quality control program that includes:
 - a. The right to reject any used etchant solution or CAC that does not comply with the specifications set forth in Condition 3 above;

AGREED.

- b. Daily testing of a representative sample of each shipment for its copper content;

NOT AGREED. This requirement is over burdensome and unnecessary as long as the material is securely stored after it is tested and accepted upon arrival.

- c. Visual inspection of each load to ensure that no waste is contained in that load;

AGREED.

- d. Before receiving any used etchant solution or CAC from a new supplier not identified in APEX's petition AS 15-2, testing pursuant to TCLP Method 1311, of a representative sample of each source of CAC from that new supplier;

AGREED.

- e. Interim testing of a representative sample of each source of used etchant

solution, pursuant to TCLP Method 1311, from each supplier. Such interim will be performed at least every six months, or upon significant changes in operating conditions; and

AGREED. Further, prior to actual processing, all CAC would be further tested for Copper content, pH, and limited TCLP as an additional quality control measure.

- f. Contractual agreement between APEX and its suppliers that the suppliers will notify APEX upon significant changes in the suppliers operating conditions that would affect the characteristics of the used etchant solution.

AGREED.

6. APEX must maintain documentation showing receipt of and payment for the used etchant solution by APEX and documentation of the sale of fresh etchant and copper oxide.

AGREED.

7. In the event of a change in APEX's processing used etchant solution to produce fresh etchant solution and copper oxide, APEX must seek a new determination from the Board that the used etchant solution is not a waste.

AGREED.

8. If APEX ceases to process and return the used etchant solution to the economic mainstream in the form of a raw material or product, the used etchant solution is considered "discarded" and, thus, a waste.

AGREED.

In conclusion, APEX would like to thank the Board for its insightful questions, and we hope we have addressed them all in a sufficient manner. APEX is available for any follow up questions or need for clarification prior to our hearing date of January 7, 2015.

Respectfully submitted,

APEX MATERIAL TECHNOLOGIES, LLC

Dated: December 29, 2014

By: /s/ Joseph L. Pellis II

Joseph L. Pellis II, *Esq.*

Daniel R. Lavoie, *Esq. (pro hac vice)*

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Lisle, Illinois 60532

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f: +1 (630) 442-5519

jpellis@pellislaw.com

Attorneys for the Petitioner

Exhibit 1



10 Industry Avenue • Joliet, IL 60435 • Phone: 815-727-3010 • Fax: 815-727-7545

PRODUCT SUPPLY AGREEMENT

This **Product Supply Agreement** (the "Agreement") is dated as of _____, 2014 (the "Effective Date") between _____ ("Customer") and Apex Material Technologies, LLC ("Apex") (collectively "the Parties").

RECITALS

Whereas, Apex intends to construct and operate a copper ammonium chloride ("Used Etchant") processing and a fresh etchant ("Fresh Etch") production operation; and

Whereas, Apex intends to commission the facility in the 4th quarter of 2014 and start taking in Used Etchant tentatively in the 4th quarter of 2014 but no later than the 1st quarter of 2015; and

Whereas, Customer desires to sell Used Etchant to Apex, and Apex desires to purchase certain Used Etchant pursuant to the terms and conditions of this Agreement; and

Whereas, Apex desires to sell, and Customer desires to purchase, Fresh Etch pursuant to the terms and conditions of this Agreement; and

Whereas, Apex will have the ability to process the Used Etchant solution as a raw material in its production process to make Fresh Etch; and

Whereas, the Parties agree that the forgoing recitals are a material part of this Agreement and are incorporated herein by reference.

Now Therefore, the Parties hereby agree as follows:

Section 1. Term

The term of this Agreement shall be (5) years from the Effective Date, automatically renewing for an additional term if notice is not provided sixty (60) days prior to expiration.

Section 2. Material and Approval

Customer will provide Apex with an Initial Sample that is representative of Used Etchant ("Material") that Customer shall sell to Apex under this Agreement, along with the completed Raw Material Profile Form attached as Exhibit A, for testing and review. Based on the test results of the Initial Sample and the information provided by the Customer on the Raw Material Profile Form, Apex will approve Used Etchant that meets the specifications in Exhibit B for shipment to Apex's Facility located at 10 Industry Drive, Joliet, Illinois ("Apex Facility") under the conditions herein.

In Apex's discretion, the Customer may be required to send a pre-shipment sample of each individual shipment with a completed Raw Material Profile Form for testing and approval prior to shipping any Used Etchant to the Apex Facility.

A completed Raw Material Profile Form shall not be required with each shipment, however, each shipment will be sampled and tested at delivery to ensure compliance with specifications before acceptance. If the Used Etchant does not meet specifications, the shipment will be refused, and Apex will provide immediate notification and testing documentation to the Customer, which shall immediately have the Used Etchant returned to its place or origin or removed from the Apex Facility and transported to an alternative location at Customer's direction and at Customer's sole cost and expense.

Apex certifies that it shall use the accepted Used Etchant as a raw material in an industrial process and will, upon request, provide a certification to the Customer as verification that the Used Etchant has been used accordingly.

Section 3. Shipping and Delivery.

Customer is responsible for ensuring that the Material and shipping documentation conform to applicable local, state, and Federal laws and regulations, indemnifying, defending, and holding Apex harmless in the event of any violations hereof. Customer shall not ship, and Apex shall not accept, any Material properly classified as "solid waste" or "hazardous waste" under any local, state or Federal laws or regulations.

Section 4. Payment

Terms of Payment are as follows:

Quotation Period: COMEX Month of receipt

Payment: See Exhibit C

Terms: 90 days from date of receipt

Freight: At the expense of the Customer

Volume: Apex shall purchase 100% of volume as generated by Customer, or as otherwise agreed to by the Parties.

Exclusivity: Customer shall exclusively sell the Material to Apex during the term of this Agreement and during all extensions thereof.

Section 5. Fresh Etch: Customer agrees to purchase 100% of their Fresh Etch requirements from Apex during the term of this Agreement and during all extensions thereof. Payment terms will include the following:

Freight - Customer paid

Pricing - \$_____/Gallon, subject to review quarterly based on any raw material and/or packaging pricing changes.

Terms - 30 days

Customer shall provide for the loading, transportation and delivery to Customer locations of all Fresh Etch from the Apex Facility. Title to and risk of loss of the Fresh Etch shall pass to Customer upon loading of the Fresh Etch into Customer's tank trucks.

Section 5. Other Conditions:

Title to and risk of loss of the Material shall pass to Apex upon Apex's receipt of the Material at Apex's Facility. Customer shall defend, indemnify, and hold harmless Apex, its employees and agents from and against all claims, liabilities, damages, fines, penalties, judgments, expenses (including attorneys' fees) and losses arising in full or in part from any act or omission, including negligence, of Customer in any way relating to, arising out of, or incidental to this Agreement. Both Apex and Customer, at their own expense, shall provide and maintain during the performance of its work hereunder insurance in the amount of \$2MM to cover the risks associated with the contractual, regulatory, and common law obligations of the other. Customer covenants and agrees that it shall notify Apex immediately upon any significant changes in its operating conditions that would in any way affect the chemical characteristics of the Material.

Section 6. Force Majeure

Apex shall not be held responsible for damages caused by delay or failure to perform hereunder, when such delay or failure is due in whole or in part to acts of God, strikes, breakdowns, delays of transportation, or any other cause beyond the reasonable control of the party, and performance shall be extended by the actual time of delay caused by the occurrence.

Section 8. Confidentiality Clause

The Customer understands and agrees that the processes contemplated under this Agreement are confidential and proprietary to Apex, and further agrees to keep the existence, terms, conditions, and pricing of this Agreement strictly confidential, and shall not disclose to any third-party any information regarding this Agreement without the express written authorization of Apex.

Section 9. Entire Agreement

This Agreement constitutes the entire Agreement between the Parties with respect to the subject matter of this Agreement and supersedes all additional written and oral agreements and understandings among Customer and Apex with respect to the subject matter of this Agreement. This Agreement may not be amended except by a written agreement executed by the party to be charged with the amendment.

IN WITNESS WHEREOF, this Agreement has been executed by the parties hereto as of the day and year first written above.

CUSTOMER

By: _____
Name:
Title:

APEX MATERIAL TECHNOLOGIES, LLC

By: _____
Name:
Title:

Raw Material Profile Form



MATERIAL TECHNOLOGIES, LLC

10 Industry Avenue • Joliet, IL 60435 • Phone: 815-727-3010 • Fax: 815-727-7545

RAW MATERIAL PROFILE FORM

Ship to: Apex Material Technologies
10 Industry Avenue
Joliet, Illinois 60435

Date: _____

Apex Contact: Lee Welgs

lwelgs@apexmattech.com

Cell #: 330-571-2182

Company Name: _____

Date of Sample: _____

Time of Sample: _____

Name of Individual: _____

Signature: _____

Title: _____

Company: _____

Street Address: _____ Phone: _____

City: _____ State: _____ Zip: _____ Fax: _____

Contact Name: _____ Emergency Phone #: _____

E-Mail: _____

Material Name: _____

Physical State: _____ Wt% of Water: _____

Wt% of Free Acid: _____ pH: _____ Specific Gravity: _____

Does this material contain any of the following?: Halogenated organics, (PCB), Dioxin, Medical Waste, Shock Sensitive Materials, Biohazards, Furans, Asbestos, Radioactive Wastes, Solvents, Phenolics, Explosives

Yes: _____ No: _____

Any other hazardous constituents (Toxics, Metals, etc) Yes: _____ No: _____

Describe Process Generating the Material (attach block flow diagram) See Attachment D

Attach MSDS: Yes: X No: _____ If no, when will it be forwarded: _____

Attach Assay: Yes: X No: _____ If no, when will it be forwarded: _____

Expected Packaging: _____

Volume Generated Per Annum: _____

Regulatory Classification: _____

DOT Shipping Name: _____ Class: _____ UN/NA #: _____



10 Industry Avenue • Joliet, IL 60435 • Phone: 815-727-3010 • Fax: 815-727-7545

Handling Instructions: _____

Other Special Instructions: _____

Profile and Sample Certification:

“As the seller of the Material described herein, I hereby certify and warrant based on a reasonable investigation: (1) that all information submitted on this profile is complete and accurate; (2) that all known or suspected hazards are disclosed; (3) that the sample submitted with this document was collected using the appropriate sampling technique and is representative of the actual stream; (4) that the sample is properly classified, packaged, marked, and labeled; and (5) that the package is in proper condition for transporting according to DOT regulations.

I, further certify and warrant that the Material sold to APEX under the terms and conditions of this Agreement qualifies for use as a commercial product/raw material, and is excluded from being a solid waste, hazardous waste, special waste, or other discarded material under all applicable local, state, and federal laws, rules, and regulations including but not limited to 40 CFR 261 *et seq.*, and 35 IAC 721 *et seq.*”

Signature: _____ Date: _____

Name and Title: _____

EXHIBIT B

APPROVED SPECIFICATION

COPPER AMMONIUM CHLORIDE

PARAMETER	UNIT OF MEASURE	RANGE
Copper, as Cu	g/l	130 – 165
Copper, as Cu	Oz/Gal	16 – 22
Chloride, as NH ₄ Cl	g/l	No Limit

Appearance: Dark blue liquid, free of suspended matter, with ammonium odor.

Packaging: 55 gallon drum and/or 330 gallon tote and/or tankwagon

EXHIBIT C

<u>COMEX</u>	<u>RATE OF RETURN TO CUSTOMERS</u>
≤ \$2.50	No return
\$2.51 - \$3.00	5% of COMEX
\$3.00 - \$3.50	7.5% of COMEX
\$3.50 - \$4.00	10% of COMEX
\$4.00 - \$4.50	12.5% of COMEX
\$4.51 - \$5.00	15% of COMEX
> \$5.00	Re-determine

EXHIBIT D



Ammoniacal Etching Process.pdf

FIGURE 2
AMMONIACAL ETCHING PROCESS

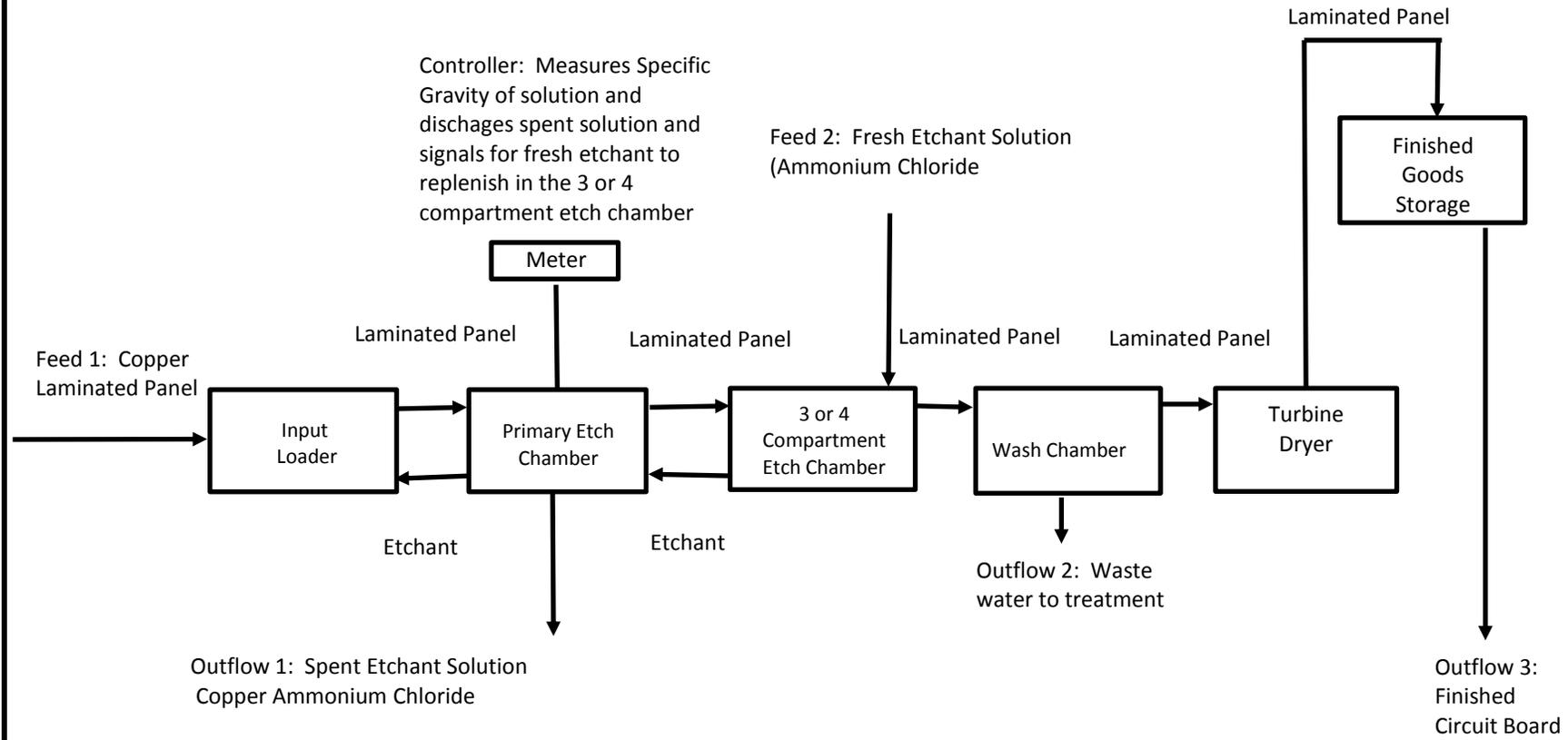


EXHIBIT E

MSDS



MSDS CuNH4Cl.pdf

MATERIAL SAFETY DATA SHEET

Date Issued: 11-14-2007

Product Name: Copper Ammonium Chloride

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: Copper Ammonium Chloride

GENERAL USE: Alkaline Copper Etchant for Printed Circuit Boards

PRODUCT DESCRIPTION: Alkaline Copper Etchant for Printed Circuit Boards

MANUFACTURER

Delta Precision Circuits

1370 Lively Blvd.

Elk Grove, IL 60007

**24 HR. EMERGENCY TELEPHONE
NUMBERS**

CHEMTREC: (800) 424-9300

CHEMTREC International (703) 527-3887

2. COMPOSITION / INFORMATION ON INGREDIENTS

<u>Chemical Name</u>	<u>Wt.%</u>	<u>CAS#</u>
COPPER (II) CHLORIDE	10 - 20	7447-39-4
AMMONIUM CHORIDE	10 - 20	12125-02-9
AMMONIUM HYDROXIDE	1 - 5	1336-21-6
WATER	55 - 79	7732-18-5
	- -	

3. HAZARDS IDENTIFICATION

EYES: Corrosive to the eyes and may cause severe damage including blindness,

SKIN: Extremely irritating to the skin. Frequent or prolonged contact may irritate the skin and cause a rash (dermatitis).

INGESTION: Toxic and may be fatal ; may produce kidney and liver damage. Can burn mouth, throat and stomach. May cause vomiting. If vomiting does not occur immediately systemic copper poisoning may occur. Symptoms may include capillary damage, headache, cold sweat, weak pulse, kidney and liver damage, central nervous excitation followed by depression, jaundice, convulsions, paralysis, and coma. Death may occur from shock or renal failure

INHALATION: Prolonged or repeated exposure to dusts of copper salts may cause discoloration of the skin or hair, ulceration and perforation of the nasal septum, runny nose, metallic taste, atrophic changes, and irritation of the mucous membranes.

Exposure may aggravate other pre-existing diseases, including diseases of the eyes, skin, and lungs.

4. FIRST AID MEASURES

EYES: Immediately flush with plenty of water. After initial flushing, remove any contact lenses and continue flushing for at least 15 minutes. Have eyes examined and tested by medical personnel.

SKIN: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention immediately. Thoroughly wash (or discard) clothing and shoes before reuse.

INGESTION: If swallowed, do NOT induce vomiting. Give victim a glass of water or milk. Call a physician or poison control center immediately. Never give anything by mouth to an unconscious person.

INHALATION: Rescuers should put on appropriate protective gear. Remove from area of exposure. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Keep victim warm. Get immediate medical attention.

5. FIRE FIGHTING MEASURES

FLASHPOINT AND METHOD: None

FLAMMABLE LIMITS: LEL = 15.75; UEL = 26 (Limits are for NH₃)

AUTOIGNITION TEMPERATURE: None

FLAMMABLE CLASS: IV

EXTINGUISHING MEDIA: Use alcohol foam, carbon dioxide, or water spray when fighting fires involving this material. Cool fire exposed container with water. Exposure to extreme heat may cause containers to burst.

OTHER CONSIDERATIONS: Water runoff can cause environmental damage. Dike and collect water used to fight fire.

FIRE FIGHTING EQUIPMENT: As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

SMALL SPILL: Ventilate area of leak or spill. Vacuum or sweep up material and place in disposal container. Absorb spill with inert material (e.g. dry sand or earth).

LARGE SPILL: Large spills may be neutralized with dilute alkaline solutions of soda ash, or lime. Do not flush to sewer.

7. HANDLING AND STORAGE

GENERAL PROCEDURES:

HANDLING: Wash hands thoroughly after handling. Use with adequate ventilation. Avoid breathing (dust, vapor, mist, gas). Avoid contact with eyes, skin, and clothing.

STORAGE: Store in a cool place in original container and protect from sunlight. Store away from heat. Store away from incompatible materials. Keep from freezing. Keep container closed when not in use. Keep away from food and drinking water.

ELECTROSTATIC ACCUMULATION HAZARD: No.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION**EXPOSURE GUIDELINES:****OSHA HAZARDOUS COMPONENTS (29 CFR 1910.1200)**

	EXPOSURE LIMITS					
	OSHA PEL		ACGIH TLV		Supplier OEL	
	ppm	mg/m³	ppm	mg/m³	ppm	mg/m³
Copper (II) Chloride	TWA	1*		1*		
	STEL					
Ammonium Chloride	TWA				10**	
	STEL					
Ammonium Hydroxide	TWA			25***		50***
	STEL					

TABLE FOOTNOTES:

*Cu

**Fume

***NH₃

ENGINEERING CONTROLS: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Local exhaust ventilation may be necessary to control any air contaminants to within their TLV's during the use of this product.

PERSONAL PROTECTIVE EQUIPMENT

EYES AND FACE: Wear safety glasses with side shields (or goggles) and a face shield.

SKIN: Use gloves, recommended for this material by manufacturers or suppliers based on test data showing adequate permeation and penetration resistance.

RESPIRATORY: A NIOSH-approved air purifying respirator with the appropriate cartridge or canister for the hazards may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits. Protection provided by air purifying respirators is limited. Use appositve-pressure air-supplied respirator if there is any potential for an uncontrolled release, exposure levels are not known, or any other circumstances where air-purifying respirators may not provide adequate protection.

PROTECTIVE CLOTHING: Use appropriate body coverings recommended for this material by manufacturers or suppliers based on test data showing adequate permeation and penetration resistance.

9. PHYSICAL AND CHEMICAL PROPERTIES**PHYSICAL STATE:** Liquid**ODOR:** Strong ammonia. DO NOT SMELL.**APPEARANCE:** Clear**COLOR:** Deep blue**pH:** 7.8 – 9.2**PERCENT VOLATILE:** 60% - 80%**VAPOR PRESSURE:** mm Hg at 20°C Approximately 20**VAPOR DENSITY:** (air=1) 0.6**BOILING POINT:** °C (°F) 100 (212)**SOLUBILITY IN WATER:** Miscible**EVAPORATION RATE** (butyl acetate=1): 0.1**SPECIFIC GRAVITY:** 1.17

10. STABILITY AND REACTIVITY**STABLE:** Stable under normal conditions of use and storage.**HAZARDOUS POLYMERIZATION:** Will not occur.**CONDITIONS TO AVOID:** Incompatibles. Direct sunlight. Exposure to heat. Protect from freezing.**HAZARDOUS DECOMPOSITION PRODUCTS:** Thermal decomposition may produce fumes of copper. Thermal decomposition may produce hydrogen chloride or chlorine compounds. Thermal decomposition may release toxic ammonia fumes. Thermal decomposition releases oxides of nitrogen.**INCOMPATIBLE MATERIALS:** Alkalies. Potassium, sodium, hydrazine, nitromethane, aluminum, strong oxidizers, acetylene, sodium hypobromite, sulfides, sulfites, and formaldehyde. Corrosive to metals; reacts exothermally with strong bases and oxidizers.

11. TOXICOLOGICAL INFORMATION**CARCINOGENICITY****IARC:** No**NTP:** No**OSHA:** No

There is no experimental toxicity data for this product. Refer to the data listed below for relative toxicity assessment.

100% CUPRIC CHLORIDE**INTRAPERITONEAL LD₅₀ :** mg/kg (species) 14,700 µg/Kg (Rat); 4,700 µg/Kg (Mouse)

LDLo: 35mg/Kg (Mouse) Reproductive Effects

INTRAVENOUS LD₅₀ : 17,500 µg/Kg (Mouse); 5mg/Kg (Rat)**ORAL LD₅₀ :** mg/kg (species) 584 (Rat); 233 (Mouse)**INHALATION TCLo** (species): 20µg/M3/26W (Rat)**OTHER:** NIOSH immediately dangerous to health and life (IDLH) 100 mg/m³ in air as Cu.

GENERAL COMMENTS: Refer to Section 3 for additional information on potential health effects.

100% AMMONIUM CHLORIDE

INTRAMUSCULAR TOXICITY: LD₅₀: 30 mg/Kg (Rat)

INTRAPERITONEAL TOXICITY: LD₅₀ : 1439 mg/kg (Mouse)

SUBCUTANEOUS TOXICITY: LDLo: 500 mg/Kg (Rat)

ORAL TOXICITY LD₅₀: 1,650 mg/kg (Mouse); 1,300 mg/Kg (Mouse)

EYE TOXICITY: Sev 500 mg/24H (Rabbit)

OTHER: NIOSH immediately dangerous to health and life (IDHL) 100 mg/m³ in air as Cu.

GENERAL COMMENTS: Refer to Section 3 for additional information on potential health effects.

100% AMMONIUM HYDROXIDE

ORAL TOXICITY: LDLo: 43 mg/kg (Human)

ORAL TOXICITY: LD₅₀: 350 mg/kg (Rat)

ORAL TOXICITY: LDlo: 750 mg/Kg (Cat)

EYE TOXICITY: SEV 1mg/30s Rns (Rabbit)

INHALATION TOXICITY: LDLo: 5000 ppm (Human)

INHALATION TOXICITY: TCLo: 700 PPM: Eye (Human)

INHALATION TOXICITY: TCLo: 408 ppm: Irr (Human)

GENERAL COMMENTS: Refer to Section 3 for additional information on potential health effects.

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL DATA: Harmful to fish and other water organisms. Keep out of waterways.

13. DISPOSAL CONSIDERATIONS

DISPOSAL METHOD: Dispose in accordance with federal state, local environmental regulatory requirements.

14. TRANSPORT INFORMATION

DOT (DEPARTMENT OF TRANSPORTATION)

PROPER SHIPPING NAME: Corrosive Liquid, Basic, Inorganic, N.O.S. (Copper(II) chloride, Ammonium chloride)

TECHNICAL NAME: Copper(II) Chloride, Ammonium Chloride

PRIMARY HAZARD CLASS/DIVISION: 8

UN/NA NUMBER: UN 3266

PACKING GROUP: II

LABEL: Corrosive

OTHER SHIPPING INFORMATION: RQ is applicable when shipping 10# or more copper chloride, 1000# or more ammonium chloride or 5000# or more of ammonium chloride in one package.

Additional Marking: "Marine Pollutant" required for bulk shipment.

The words "Marine Pollutant" must be entered on the Shipping Paper in association with the basic DOT description for bulk shipments and containers must be marked as a "Marine Pollutant". In addition, any quantity shipped by vessel must be identified and marked as a "Marine Pollutant".

15. REGULATORY INFORMATION

TOXIC SUBSTANCES CONTROL ACT (TSCA): Chemical ingredients are on the TSCA inventory.

SUPERFUND REPORTABLE QUANTITY (RQ): 10#/4.54 Kg (CuCl₂), 5000# - Ammonium chloride, 1000# - Ammonium Hydroxide

SARA TITLE III (SECTION 313): This product contains a copper compound which is subject to reporting. This product contains ammonia and subject to reporting as ammonia and ammonium ion on an ammonia basis = 1.6 lb/gal.

CALIFORNIA PROPOSITION 65 WARNING: This product may contain chemicals known to the state of California to cause cancer, or birth defects or other reproductive harm.

CANADIAN LISTS

DSL/NDSL: Found on the domestic substances list.

WHMIS: Copper (II) Chloride item number 430 from the ingredient disclosure list and is subject to reporting at 1% threshold; Ammonium Hydroxide: Item number 96, reporting at 1% threshold; Ammonium Chloride: Item number 88, reporting at 1% threshold.

STATE LISTS: This product contains ingredients that are listed for disclosure or reporting in the states of California, Connecticut, Illinois, Louisiana, Massachusetts, Michigan, Minnesota, North Carolina, New Jersey, New York, Oregon, Pennsylvania, Rhode Island, and Texas. Please check with appropriate agencies.

16. OTHER INFORMATION

It is reasonable to assume that ammonia etchant compounds contain arsenic, cadmium, chromium, and lead in concentrations ranging from a few parts per billion to several parts per million. It is reasonable to assume that copper compounds contain arsenic, cadmium, chromium, and lead in concentrations ranging from a few parts per billion to several parts per million.

All information presented herein is given in good faith and is based on sources and tests considered to be reliable, but cannot be guaranteed. It is the user's full responsibility to accept risk for safety, toxicity, handling, storage, and use of the product, as well as to determine the suitability of the product for a specific purpose. We make no warranty as to the results to be obtained in using the product; therefore all risks must be assumed by the user.

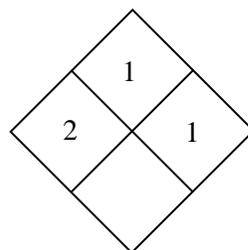
NFPA RATINGS

Exhibit 2

Filed separately as a trade secret, pursuant to 35 Ill. Adm. Code Part 130

Exhibit 3

Filed separately as a trade secret, pursuant to 35 Ill. Adm. Code Part 130

Exhibit 4

Filed separately as a trade secret, pursuant to 35 Ill. Adm. Code Part 130

Exhibit 5



PHOENIX

STAFFING & MANAGEMENT SYSTEMS, INC.

777 Roosevelt Road, Suite 200, Glen Ellyn, Illinois 60137
Phone (630)-446-4030 Fax (630)-446-4031

December 10, 2015

Mr. Lee Welgs
Vice President and General Manager
Apex Material Technologies, LLC
10 Industrial Avenue
Joliet, Illinois 60435

Dear Lee

Subject: Copper Ammonium Chloride Solution (spent etchant) shelf-life, reuse

Copper Ammonium Chloride's shelf life is indefinite if stored in a sealed container. Decomposition would only occur through evaporation of liquid. In the event that evaporation did occur the addition of ammonia would digest the precipitate therefore returning the product back to a copper ammonium solution. Simple degradation would not affect the use of the material in your process.

The chemistry of copper ammonium chloride can be reused when the ammonia is used to manufacture alkaline etchant solution or other ammonia based products. The copper contained is then used in the manufacture of base metal chemicals. In the case of alkaline etchant the ammonia at some level of concentration can be reused over and over again.

I am intimately knowledgeable of the chemistry and processing of copper ammonium chloride. I participated in the engineering, design, construction and operation of the copper ammonium chloride operations at your Joliet facility from 1973 until 2000.

Sincerely,

Jerome W. Cassata

Jerome W. Cassata
Chief Executive Officer

Exhibit 6

Filed separately as a trade secret, pursuant to 35 Ill. Adm. Code Part 130

Exhibit 7

Filed separately as a trade secret, pursuant to 35 Ill. Adm. Code Part 130

Exhibit 8

Filed separately as a trade secret, pursuant to 35 Ill. Adm. Code Part 130

Exhibit 9

Electronic Filing - Received, Clerk's Office : 12/29/2014
STRAIGHT BILL OF LADING
 ORIGINAL - NOT NEGOTIABLE

Shipper No. _____

Carrier No. _____

Date _____

(Name of Carrier): _____

TO: Consignee APEX Material Technologies, LLC	FROM: Shipper ITO Industries	
Street: 10 Industry Ave.	Street: 8433 197th Ave.	
Destination: Joliet, IL 60435 (815) 727-3010	Origin: Bristol, WI 53104 (262) 857 - 7904	
P.O. Number		Vehicle Number
APEX Material Technologies, LLC (CCN 650370)		In Emergency contact: CHEMTREC 1-800-424-9300

No. Shipping Units	HM*	Proper Shipping Name, Kind of Packaging, Description of Articles, Hazardous Class, I.D. #, Packing, Group	Weight	Rate	Placards Required
1	RQ	UN3266, Corrosive Liquid, Basic, Inorganic, N.O.S. (Ammonium Hydroxide, Ammonium Chloride), 8 , PG II **FREEZABLE STORE ABOVE 50 DEGREES** EMERGENCY RESPONSE GUIDE # 154	_____	_____	_____

Note - Where the rate is dependent on value, shippers are required to state specifically in writing the agreed or declared value of the property. The agreed or declared value of the property is hereby specifically stated by the shipper to be not exceeding \$ _____ per _____	This is certified that the above named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation. _____ Signature	Subject to Section 7 of the conditions, if this shipment is to be delivered to the consignee without recourse on the consignor, the consignor shall sign the following statement: The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges. _____ (Signature of Consignor)	Prepaid COLLECT THIRD PARTY
--	---	--	--

RECEIVED, subject to the classifications and lawfully filed tariffs in effect on the date of the issue of the Bill of Lading, the property described above in apparent good order, except as noted (contents and conditions of contents of packages unknown) marked, consigned, and destined as indicated above which said carrier (the word carrier being understood throughout this contract as meaning any person or corporation in possession of the property under the contract) agrees to carry to its usual place of delivery at said destination, if on its route, otherwise to deliver to another carrier on the route to said destination. It is mutually agreed as to each carrier of all or any of, said property over all or any portion of said route to destination and as to each party at any time interested in all or any said property, that every service to be performed hereunder shall be subject to all the bill of lading terms and conditions in the governing classification on the date of shipment.
 Shipper hereby certifies that he is familiar with all of the bill of lading terms and conditions in the governing classification and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns.

SHIPPER:	PLACARDS RECEIVED YES ____ NO ____	CARRIER
PER	EMERGENCY RESPONSE GUIDE BOOK IN POSSESSION YES ____ NO ____	PER
DATE:	EMERGENCY RESPONSE PAGES ACCEPTED YES ____ NO ____	DATE

Exhibit 10

Electronic Filing - Received, Clerk's Office : 12/29/2014
STRAIGHT BILL OF LADING
 ORIGINAL - NOT NEGOTIABLE

Shipper No. _____

Carrier No. _____

Date _____

(Name of Carrier): _____

TO: Consignee ITO Industries	FROM: Shipper Apex Material Technologies	
Street: 8433 197th Ave.	Street: 10 Industry Ave.	
Destination: Bristol, WI 53104 (262) 857 - 7904	Origin: Joliet, IL 60435 (815) 727-3010	
P.O. Number		Vehicle Number
APEX Material Technologies, LLC (CCN 650370)		In Emergency contact: CHEMTREC 1-800-424-9300

No. Shipping Units	HM*	Proper Shipping Name, Kind of Packaging, Description of Articles, Hazardous Class, I.D. #, Packing, Group	Weight	Rate	Placards Required
1	RQ	UN3266, Corrosive Liquid, Basic, Inorganic, N.O.S. (Ammonium Hydroxide, Ammonium Chloride), 8 , PG II **FREEZABLE STORE ABOVE 50 DEGREES** EMERGENCY RESPONSE GUIDE # 154	_____	_____	_____

Note - Where the rate is dependent on value, shippers are required to state specifically in writing the agreed or declared value of the property. The agreed or declared value of the property is hereby specifically stated by the shipper to be not exceeding \$ _____ per _____	This is certified that the above named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation. _____ Signature	Subject to Section 7 of the conditions, if this shipment is to be delivered to the consignee without recourse on the consignor, the consignor shall sign the following statement: The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges. _____ (Signature of Consignor)	Prepaid COLLECT THIRD PARTY
--	---	--	--

RECEIVED, subject to the classifications and lawfully filed tariffs in effect on the date of the issue of the Bill of Lading, the property described above in apparent good order, except as noted (contents and conditions of contents of packages unknown) marked, consigned, and destined as indicated above which said carrier (the word carrier being understood throughout this contract as meaning any person or corporation in possession of the property under the contract) agrees to carry to its usual place of delivery at said destination, if on its route, otherwise to deliver to another carrier on the route to said destination. It is mutually agreed as to each carrier of all or any of, said property over all or any portion of said route to destination and as to each party at any time interested in all or any said property, that every service to be performed hereunder shall be subject to all the bill of lading terms and conditions in the governing classification on the date of shipment.

Shipper hereby certifies that he is familiar with all of the bill of lading terms and conditions in the governing classification and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns.

SHIPPER:	PLACARDS RECEIVED YES ____ NO ____	CARRIER
PER	EMERGENCY RESPONSE GUIDE BOOK IN POSSESSION YES ____ NO ____	PER
DATE:	EMERGENCY RESPONSE PAGES ACCEPTED YES ____ NO ____	DATE

Exhibit 11

Electronic Filing - Received, Clerk's Office : 12/29/2014
STRAIGHT BILL OF LADING
 ORIGINAL - NOT NEGOTIABLE

Shipper No. _____

Carrier No. _____

Date _____

(Name of Carrier): _____

TO: Consignee MK Import/ Export Inc	FROM: Shipper APEX Material Technologies, LLC
Street: c/o Gateway Warehouses Inc. 7800 Grant Ave.	Street: 10 Industry Ave.
Destination: Cuyahoga Heights, OH 44105 (440) 808-1000	Origin: Joliet, IL 60435 (815) 727-3010

P.O. Number APEX Material Technologies, LLC (CCN 650370)	Vehicle Number
In Emergency contact: CHEMTREC 1-800-424-9300	

No. Shipping Units	HM*	Proper Shipping Name, Kind of Packaging, Description of Articles, Hazardous Class, I.D. #, Packing, Group	Weight	Rate	Placards Required
1		<p>Copper Oxide Technical Grade DOT NOT REGULATED C/ A REQUIRED WITH SHIPMENT Product code = CU30078-TECH Item = Copper Oxide Technical Grade LOT # _____</p>	2,000#		

Note - Where the rate is dependent on value, shippers are required to state specifically in writing the agreed or declared value of the property. The agreed or declared value of the property is hereby specifically stated by the shipper to be not exceeding \$ _____ per _____	This is certified that the above named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation. _____ Signature	Subject to Section 7 of the conditions, if this shipment is to be delivered to the consignee without recourse on the consignor, the consignor shall sign the following statement: The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges. _____ (Signature of Consignor)	Prepaid COLLECT THIRD PARTY
--	---	--	--

RECEIVED, subject to the classifications and lawfully filed tariffs in effect on the date of the issue of the Bill of Lading, the property described above in apparent good order, except as noted (contents and conditions of contents of packages unknown) marked, consigned, and destined as indicated above which said carrier (the word carrier being understood throughout this contract as meaning any person or corporation in possession of the property under the contract) agrees to carry to its usual place of delivery at said destination, if on its route, otherwise to deliver to another carrier on the route to said destination. It is mutually agreed as to each carrier of all or any of, said property over all or any portion of said route to destination and as to each party at any time interested in all or any said property, that every service to be performed hereunder shall be subject to all the bill of lading terms and conditions in the governing classification on the date of shipment.

Shipper hereby certifies that he is familiar with all of the bill of lading terms and conditions in the governing classification and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns.

SHIPPER:	PLACARDS RECEIVED YES _____ NO _____	CARRIER
PER	EMERGENCY RESPONSE GUIDE BOOK IN POSSESSION YES _____ NO _____	PER
DATE:	EMERGENCY RESPONSE PAGES ACCEPTED YES _____ NO _____	DATE

Exhibit 12

Filed separately as a trade secret, pursuant to 35 Ill. Adm. Code Part 130