



ASSOCIATION CONNECTING  
ELECTRONICS INDUSTRIES®

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July 30, 2007

Ms. Nicole Sotak  
Chief Environmental Analysis and Regulations Section  
Department of Toxic Substances Control  
P.O. Box 806  
Sacramento, CA 95812-0806

RE: Proposed Permit by Rule for Treatment of Aqueous Wastes Containing Cyanides  
Department Reference Number R-96-48

Dear Ms. Sotak:

IPC - the Association Connecting Electronics Industries and the California Circuits Associations (CCA) are concerned that the above referenced proposal appear to inappropriately and unnecessarily regulate gold plating rinse waters generated from the manufacture of printed circuit boards (PCBs). IPC and the CCA are pleased to submit these comments in the hopes of assisting the California Department of Toxic Substances Control (DTSC) in clarifying the applicability of the proposed regulations.

IPC is the national trade association for the electronic interconnection industry, and represents more than 2,400 member companies in the United States, including 371 in California. The IPC members manufacture printed circuit boards and electronic assemblies, which are used in a variety of electronic devices including computers, cell phones, pacemakers, and sophisticated missile defense systems. The industry is vital to the U.S. economy, employing more than 350,000 people and exceeding \$44 billion in sales. Although IPC members include electronic giants, sixty percent of IPC members meet the Small Business Administration's definition of "small business."

While the proposed regulations appear to apply to certain PCB processes involving cyanide plating and rinsing, they appear to have been written based on cyanide processes in the metal finishing industry. While both industries utilize cyanide plating processes, the processes are entirely different. Unlike general metal finishing, cyanide plating is used on a very limited basis in PCB manufacture, solely for the application of gold plating to component contact areas.

Gold plating of the PCB component contact areas is a minor operation in PCB manufacturing. Component contact areas (where customers attach a component to a bare PCB using hand or wave soldering, surface mount or other technologies) is typically less than 10% of the outer surface area of most PCBs. Due to the value of the gold plating bath chemistry, the PCB gold plating sequence is a gold bath, followed by a stagnant drag out rinse, that is then followed by a running rinse. Each tank is small, generally about 50 gallons. The running rinse is typically 1-2 gallons per minute (gpm). Hence, PCB gold plating does not generate “large volumes of rinsewaters containing both dissolved metals and cyanides” as stated in the proposed regulation description of Wastestream 1. Gold drag out rinse tanks are typically discharged once a week through a Publicly Owned Treatment Works (POTW) permit-monitored discharge point.

Further, neither the drag out rinse, nor the running rinse contain anywhere close to the 5000 ppm cyanide content described in the proposed regulation 67450.11 description of Wastestream 1. Rather, PCB gold drag out rinse baths are less than 50 ppm (typically 10-20 ppm), and the running rinse contains less than 1 mg/l to meet the federal Clean Water Act (CWA) 0.65 mg/l monthly average and 1.20 mg/l daily max limits for amenable cyanide (ACN).

Due to the value of the gold plating chemistry, gold recovery in the drag out rinse tank is common in PCB gold plating lines. Typical recovery techniques utilized include a “gold bug,” ion exchange and electrowinning. These gold recovery techniques operate continuously on the gold drag out rinse tank, and are not separate from the drag out tank. Gold recovery devices can be mounted internally to the drag out tank, or are connected externally with piping and a circulation pump. Thus, all gold recovery techniques on PCB gold drag out rinse tanks are part of the gold plating process and meet the DTSC hazardous waste exclusion in 66261.4(a)(5)(A). Recovered gold in the form of a saturated absorbent “sponge,” spent ion exchange resin, or plated gold from an electrowinning cathode are then sold to off-site reclaimers and refiners.

One source of significant confusion in the proposed cyanide treatment PBR regulations is that the Department proposes to regulate “wastewaters,” but has not defined that term. A search of Title 22, Division 4.5, Chapter 11 regulations on the identification and listing of hazardous waste did not reveal any definition of the term wastewater. IPC believes that a wastewater is any process liquid that is discharged from a process with the intent of eventual discharge from the facility under an approved permit. Accordingly, gold plating baths, gold drag out rinse waters and even the rinse water in a gold running rinse tank are not wastewaters until they are discharged from the bath process tanks as they are still being used in the manufacturing process. IPC urges the Department to clarify the proposed regulations by including an appropriate definition of the term wastewater which excludes process baths.

An additional problem with the proposed regulations is that they do not specify a de minimus concentration below which the proposed rule would not apply. As such, the proposed PBR rule will apply to gold plating running rinse tanks in which cyanide concentrations are below 1 mg/l and are suitable for discharge to a POTW under federal CWA limits. By contrast, the applicability of the DTSC PBR for copper has a de minimus concentration of 25 mg/l. IPC recommends that DTSC establish a de minimus concentration for applicability of the cyanide PBR.

The proposed descriptions of the five wastestreams that DTSC proposes to be covered by the cyanide PBR regulations are too broadly and vaguely described and do not clearly define what is or is not covered by the regulation. For example, Wastestream 1 is titled “Wastewaters from rinsing workpieces and fixturing.” The Department should clarify that it does not intend to cover PCB gold drag out rinse baths that are part of the process, and rinse liquids that are not intended for discharge. Running rinse tanks with this wastestream should not be included in this regulation as discharge from these processes is already covered by a POTW permit under 40 CFR 433. IPC recommends that this description be modified to “Wastewaters from ... that is discharged from a process and intended for eventual facility discharge under an approved permit, but contains cyanide (either ACN or TCN) above permit cyanide discharge limits.”

Wastestream 3 is titled “Rinsate from pumps, containers and hoses that have been used to transfer process solutions.” This broad description would include the recirculation piping, pump and gold recovery device on PCB gold plating drag out rinse tanks, even though such equipment is part of the gold plating process and meets the 66261.4(a)(5)(A) exclusion. IPC recommends that this description be modified to include the condition “intended for either off-site shipment or eventual discharge under an approved permit.”

Wastestream 4 is titled “Waste process solutions that are treated by electrowinning for metal recovery prior to shipment to a hazardous waste treatment facility.” This description would not cover waste process solutions that are intended for on-site treatment, but if just the off-site management disposition is the focus of this listing, then IPC recommends that a second sentence be added to clarify that “Process solutions that are treated by electrowinning as part of the process are not covered by this listing.”

In addition to the proposed wastestream descriptions, IPC notes that the electrowinning treatment process description does not encompass the capabilities of certain electrowinning cells that are commercially available. For example, electrowinning cells, available from Bewt Systems of Ballwin, Missouri utilize a patented Chemelec technology from the UK which destroys 99% of cyanide. This level of cyanide destruction certainly exceeds the proposed rules claim that “some cyanide is incidentally destroyed by electrochemical oxidation during electroplating and electrowinning.” IPC has members in states other than California that utilize this technology, and one member has successfully used this approach for “in situ” cyanide destruction in the gold drag out rinse tank for the past two years. In fact, ACN concentrations in the running rinse have not exceeded 0.1 mg/l, which is much lower than the 0.65 mg/l limit in the federal standards 433.15, 433.16 and 433.17. IPC recommends that the Department update its electrowinning process description to reflect products that are commercially available. Furthermore, IPC believes the DTSC has not fulfilled its regulatory obligation to determine that no reasonable alternative exists to the proposed PBR regulations for cyanide treatment. IPC recommends that the Department examine the Bewt Chemelec electrowinning technology and reconsider the need for the proposed regulations.

The Department’s rulemaking notice asserts that DTSC is not aware of any cost impacts that a representative business would necessarily incur in reasonable compliance with the proposed regulations. IPC strongly disagrees with this statement. Several of our members have reported spending up to \$10,000 to obtain professional engineer certification of a PBR tank and secondary

containment in the state of California. Using a nominal \$2000 to \$3000 cost per tank, the proposed PBR regulation for cyanide treatment could cost PCB manufacturers hundreds of thousands of dollars if the Department were to regulate drag out and running rinse tanks that are part of the PCB gold plating process. Such costs will have an adverse financial impact on PCB manufacturers in the state of California.

IPC believes that the DTSC has failed to properly assess the need for and economic impact of the proposed cyanide treatment PBR regulations. IPC recommends that the DTSC more closely examine cyanide rinse practices in the PCB industry and how they differ from those in the metal finishing industry. The DTSC should also more closely examine existing cyanide treatment technologies. Once the Department has fully examined these factors, we believe they will find that the proposed regulations are costly and unnecessary for the PCB industry given the cyanide treatment requirements under the CWA pretreatment standards. IPC requests that the DTSC clarify the applicability of the regulations and clearly exclude PCB gold plating process rinse tanks that contain cyanide.

Should you have any questions, please contact Fern Abrams at (703) 522-0225 or [fabrams@ipc.org](mailto:fabrams@ipc.org).

Sincerely,

Fern Abrams  
Director of Environmental Policy