

Chromium Emission Control At Canyon Precision Plating And Grinding

In January 1991, Canyon Precision Plating and Grinding of Anaheim, California, moved its hard chrome plating and grinding operations from a facility located in another section of Anaheim to its current location. The relocation was occasioned by an expansion of the company to more than double its production capacity. With the move, the company found itself in the unenviable position of being the first chrome plating company to apply for a Permit to Construct under the South Coast Air quality Management District's (ACAQMD's) New Source Review of Carcinogenic Air Contaminants regulation, Rule 1401. The new rule, which was adopted in June 1990, specifies the limits for maximum individual cancer risk from new, relocated, or modified facilities which emit carcinogenic air contaminants. The physical move meant that the company would have to reduce emissions far beyond the 0.006 milligrams per ampere-hour limit set by the well known California regulation for chrome platers, Rule 1169. Rule 1401 specified that the Best available Control Technology for Toxics (T-BACT) had to be employed, and that the excess cancer risk had to be under 1 in one million for the maximally exposed individual. A cancer risk level above 1 in one million would have triggered the requirement for public notification and hearings to approve the expansion.

Conserve Engineering of Laguna Beach, CA and Midwest Air Products Company, Inc. of Traverse City, MI. collaborated to perform the required dispersion modeling, risk assessment and control system design to meet the requirements of Rule 1401. The design effort indicated that Canyon Precision would have to ventilate their hard chrome plating tanks at 11,500 cfm to meet OSHA and ACGIH tank ventilation requirements, and control exhaust emissions to less than 25 grams per year to meet the cancer risk requirements of Rule 1401. To get the task done, Midwest Air Products Company (MAPCO) engineered a special version of their Enforcer IIItm Chrome Removal System.

The exhaust and control system featured inline type mesh pad mist eliminators located at each tank, just above the hood, to capture most of the chromic acid and reclaim it with brief, periodic washdowns back to the plating tanks. Removal of nearly all the remaining chrome would be achieved with MAPCO's Enforcer IIItm, a multiple-stage mesh pad mist eliminator device utilizing a unique counter-flowing action during periodic washdowns. All washdown effluent flows would be small enough to return everything to the plating tanks, creating a "closed-loop" system. A recirculation and control system with programmable timer was designed into the system to automate all washdown functions of the Enforcer IIItm.

Conserve Engineering secured the Permit to Construct from SCAQMD and equipment was installed before the end of the year. After three months of operation, the control system was source tested in March 1992 by Pacific Environmental Services. The results of the source test indicated an average mass emission of less than 0.00015 milligrams per ampere-hour, and a facility emission of less than 12 grams per year when operated at a capacity of 80 million ampere-hours. Dispersion modeling of the actual emission rate indicated that cancer risk for the maximally exposed individual will be less than 0.5 in one million. The installed control system has established a new baseline of performance for T-BACT in the air quality district.

Canyon Precision Plating and Grinding is the first company to be issued a permit to operate unrestricted under Regulation 1401.