Achieving Air Pollution Control With Catalytic Or Thermal Oxidizers

By Charles M. Martinson

As the full effect of the Federal Clean Air Act (CAA) Amendments passed by Congress in 1990 continue to impact today’s industry, many manufacturing operations have become subject to stricter local, State and Federal clean air regulations. Both VOC (volatile organic compound) and HAP (hazardous air pollutant) emissions are strictly regulated since they lead to the formation of ground level ozone (or smog). The CAA singled out 188 air pollutants that are of special concern, many of which are used in everyday production and/or manufacturing atmospheres.

Depending upon the quantity of VOC’s and/or HAP’s involved, many businesses either have or will be required by local, State or Federal laws to install new or additional air pollution control equipment. With well over twenty-five years of proven success in a wide variety of industries, both catalytic and thermal oxidation have become very popular methods for controlling these VOC and/or HAP emissions.

Catalytic and thermal oxidation systems destroy the harmful VOC’s and HAP’s emitted from a manufacturing process by collecting the emissions and destroying them using elevated temperature and/or an industrial grade catalyst. Both catalytic and thermal oxidation assure thorough VOC and/or HAP destruction. Today’s modern and efficient systems utilize high efficiency heat exchangers, natural gas fired burners, industrial grade blowers, electric or pneumatic actuators and programmable logic controllers (PLC) to ensure safe and efficient operation.

Points To Consider When Selecting An Air Pollution Control System

The VOC’s and HAP’s present in typical process air streams can be destroyed by both catalytic and thermal oxidation systems. The type and quantity of VOC’s and HAP’s will, however, help to dictate the preferred abatement technology. High VOC/HAP concentrations would completely eliminate some technologies, while low concentrations could clearly favor an alternate technology.

Space requirements and installation locations should also be considered. The technology selection criteria should not be heavily influenced by the equipment floor plan. Most often air pollution control systems are installed outdoors and can be placed on the ground, on the building roof and/or on an elevated structural steel platform. Depending upon the process airflow requirements, systems will range from 8’ wide x 20’ long and 8,000 pounds (on the smaller size) to 40’ wide x 60’ long and 180,000 lbs., and larger. The purchaser should first become comfortable with the technology selection from an operational point of view and then consideration should be given to space requirements.

When selecting and/or sizing an air pollution control system, the facility’s growth expectations for the next 2 to 5 years should be considered. It is typically less costly to install a system that is designed to handle additional capacity now rather than to install a second system at some time in the near future. Also, many equipment vendors have the capability of providing/installing their systems under a turnkey contract where the vendor is responsible for all aspects of both installation and start-up.

As the cost of energy in North America continues to rise, purchasers should consider options to utilize the heat/energy being emitted to the atmosphere. Depending upon the VOC/HAP abatement technology being used, exhaust stack temperatures will vary between 150°F and 700°F. This heat/energy can be recovered and returned back to the manufacturing facility for uses such as process supply air for web dryers and curing ovens, to heat hot oil or water coils, to make low pressure steam, for building comfort heating or a combination of the above.

Maintenance costs have been drastically reduced over the years as air pollution control systems supplied by reputable vendors have become very reliable. However, long-term repair costs could vary greatly between different technologies if a major failure was to occur; such as the airflow switching valves or the media support structure (in a regenerative oxidizer), the shell-and-tube heat exchanger (in a recuperative oxidizer) or the catalyst (in a catalytic oxidizer). To insure proper long-term operation and to reduce the future risk of major repairs, the purchaser should implement and adhere to a stringent preventative maintenance (PM) program.

Catalytic Oxidizer.  Regenerative Thermal Oxidizer.
In-house maintenance personnel could be trained to support PM checks or the user could purchase an annual PM program from an air pollution control system vendor.

When purchasing an air pollution control system, a user will be installing a piece of equipment that will impact their plant operation for many years. An experienced vendor can help select the appropriate technology, provide estimated operating and maintenance costs and submit formal proposals with firm pricing details. While in some cases a prepackaged air pollution control system may suffice, in many situations the customer may get an enhanced design/system by seeking a customized solution. Many air pollution control system vendors offer customized solutions at no additional cost.

The CMM Group, LLC can be reached by email at info@thecmmgroup.com or by phone at 920-336-9800.

Charles M. Martinson is President of The CMM Group, LLC, of De Pere, Wisconsin. He has been involved in the design, fabrication, sales and installation of air pollution control systems for over 15 years.

Mills Purchase Acrowood Equipment

South Coast Lumber in Brookings, Oregon, and Barrette-Chapais in Chapais, Quebec, recently purchased Acrowood Slant Disc Chippers. The Oregon mill is expected to install its new Model 5216 Slant Disc Chipper in May, serving the mill’s expansion with a new waste processing line. Barrette-Chapais is taking delivery of a Model 6118 8-knife, horizontal feed Slant Disc Chipper. The high quality wastewood processing chipper will be added to the company’s sawmill.

Papiers Stadacona, a TMP pulp mill in Quebec City, Quebec, has purchased a complete Chip Thickness Screening System from Acrowood. The system includes an Acrowood Model 3096 DiamondRoll™ Variable InterRoll Opening Fines Screen, a Model 1016 Dual Drive Suspended Rotary Screen with support frame and an Acrowood Model 1030 Side Fed Screw Distributor. It was sold through ABGS Engineering in Montreal, Quebec. The purchase was made for a woodyard expansion.

For more information, contact Sales Manager, Desmond Smith, at 425-258-3555, ext. 261 or visit the website at www.acrowood.com.

PAL Announces Worldwide Sales

From March 2002 to August 2002, PAL has received numerous orders to supply machines and systems for wet furnish (fresh recycled wood) preparation. The orders were for crushers, roll screens, hammermills, wind cleaners and chips dry cleaners to Intasa (Spain), Egger-Brilon and AR-Reycling (Germany), Kaindl (Austria), Kronospan (France), Seihoku and Tokyo Board (Japan) and Frati and Morandi-Bortot (Italy).

PAL also supplied dry particles screening and sifting equipment to Egger-Brilon, Kronoply (Germany), Nexfor (Scotland), Kronotex (Germany), Glin Nazarje (Slovenia), Ainsworth (Canada), Molar Wood, Phang NGA (Thailand), Tever (Turkey), Evergreen (Malaysia) and Masisa for the mills in Brazil and Mexico.

New Orders In China For Dieffenbacher

The increasing demand for MDF and Thin HDF panels in China has spurred numerous new plant projects in this growing market segment. Dieffenbacher received 4 contracts from China for plant packages using the CPS Press Technology. Guangxi Gaofeng Wood Based Panel Ltd., already having two existing operating sites with multi-opening systems in Guangxi Province, ordered a continuous MDF plant package with a CPS press size of 8 ft by 23 m for their new plant in Rong Xian / Guangxi. This includes equipment for fiber drying, gluing, sifting and forming, as well as the main CPS production line with board outfeed and handling systems.

Lishui OAK MMB Co. Ltd. has ordered a CPS line that includes a panel handling system and Dongying Zhenghe has ordered a CPS production system. Guangxi Sunway Forest Products has placed an order for the core production plant section of its new large capacity THDF plant installation. The CPS size of 9 ft x 42 m (extendable to 48 m) will be the largest Continuous Press installation for MDF in Asia. Metso will supply the remaining equipment for Sunway.

For more information, contact Roland Jager at tel +49 (0) 7262/65-377 or email roland.jager@dieffenbacher.de.