InterMetro de Mexico Opens New Plating Line In Chihuahua

By Brett S. Drozic, CEF क्ष Tom Rash



InterMetro Industries, a division of Emerson Electric Company, has been a manufacturer of material handling and storage products for more than 70 years, with operational plants located throughout the U.S. While the company is an international organization, with sales offices all over the world, until recently only one manufacturing plant had been located outside the U.S. (with the exception of licensees). The company recently embarked on a new initiative to increase its presence in the global marketplace. With this in mind, InterMetro built a new factory in Cuauhtemoc, Chihuahua, Mexico, to serve an international market. InterMetro's corporate slogan, "We Put Space to Work," was used to guide the installation of a state-of-theart hoist nickel-chrome plating line.1 The design not only incorporates concepts that enforce the company's vision of "putting space to work," but also includes tremendous safety and environmental advantages for a plating line.

Components at Floor Level

One of the first decisions was to place the entire system at floor level.

¹Plating Engineering & Chemicals Co., Ltd. (PENC), Hong Kong

Officials at the captive shop saw a distinct advantage of having all fluids flowing at the same level, rather than having waste fluids below ground. Waste and feed water treatment are accomplished by pumps and transfer tanks. All holding tanks are manufactured from polymer materials that will not degrade over time when subjected to the severe changes in pH that can occur from various plating solutions. This allows the line to operate at an increased efficiency, because sump pumps require more energy to transfer fluids than simple transfer pumps. Additionally, polymer holding tanks with fiberglass outer shell reinforcement require less long-term maintenance than lined steel or stainless steel tanks. The above-ground storage tanks also allow greater visibility of waste and feed fluids, which ensures that any leaks in tanks can be located and repaired much faster than a seeping pit or drainage ditch.

The actual plating tanks, which were also manufactured from polymer materials, have an inside depth of nine feet. The exterior of each tank is surrounded by stainless steel reinforced ribbing that is encased in a polymer housing. Each reinforced rib was tested by electric charge to ensure that continuity did not exist, to make sure that the stainless steel is completely enclosed. The ribbing of one tank makes contact with the ribbing of both adjacent tanks. This design allows the hoop stress from the pressure of the fluids in each tank to be shared by all tanks, and to transfer it to the steel beam super-structure of the line itself. As was the case with the transfer holding tanks, the polymer plating tanks require less long-term maintenance than lined steel or stainless steel tanks.

Other Safety Features

An above-ground spill trap, or dike, was constructed around the exterior of the plating line as a safety precaution against accidental spills from any one plating tank. The spill trap was designed to hold more than 4,000 gallons, which is the most fluid contained in any plating tank. A hazardous spill team was trained to respond to accidental spills by pumping the fluid from the spill trap into one of the transfer holding tanks. This design will prevent acids and bases from mixing rapidly in large volumes-an important safety feature of the new plating line.

The rack-mountable rectifiers² are elevated from ground level. This design feature allows more space at



Rectifiers are located above ground level, and an analytical lab is housed in the space that would typically be occupied by one of the rectifiers (note the location to the back in this view).

the floor level. An analytic lab was established in the space that would normally have been occupied by one of the rectifiers. The rectifiers are placed on tracks so that they can be moved easily for maintenance purposes. Additionally, placing the rectifiers above ground ensures that accidental spills on the floor will not damage the equipment or cause electrical shock hazards.

Custom Filtering

One of the most interesting design features was the creation of a spacesaving nickel filter. Because the plating line consists of three separate split-nickel tanks, it would have required three separate filters, but InterMetro officials desired high turnover of the nickel baths to ensure purity of the system. Once again, the company's philosophy paid off. Three prototype 13,000 gal/hr slurry filters³ were custom built with single chambers containing 66 plates each. InterMetro personnel were trained to disassemble the filter cartridge and reassemble it within 30 minutes. By using polymer filter paper, personnel can reuse the filters by cleaning them off-line. Additionally, the prototype filters can be charged with 24 lb of carbon in less than 10 minutes. For



Three prototype 13,000 gal/hr slurry filters with single chambers containing 66 plates each are used on the line.

this, InterMetro opted to use a proprietary product⁴ that minimizes carbon dust in the air during the slurry process.

Computer Controls

Finally, the company installed computer software⁵ designed by the manufacturer of the line to allow rapid changes during the plating process. Each flight bar of parts can be programmed for either a different current density or a different square foot cathode area. This gives InterMetro de Mexico the flexibility to become a "lean" manufacturer. There are no gaps in between different sized parts, and no more packing the rack as full as possible. The shop can plate parts precisely and efficiently to comply with customer specifications, without suffering from restrictions caused by machine demands. The software also allows the operator to monitor temperatures, part location, current density settings, and applied voltage. Because the rectifiers are located above ground, controllers for the rectifiers, hoists, and computer monitoring station are located at ground level-"putting space to work." PESF

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Controllers for the rectifiers and hoists, as well as the computer monitoring station are located at ground level.

²Rapid Power Technologies, Inc., Brookfield, CT ³Mefiag 13000-HF-SY filters, Mefiag Division, Met-Pro Corp., Harleysville, PA

⁴Clepo Filter Act 18, MacDermid, Inc., Waterbury, CT

⁵Plating Engineering & Chemicals Co., Ltd. (PENC), Hong Kong