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MET-CHEM GROUP NEWS

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Welcome to the inaugural issue of the Met-Chem Group Quarterly Newsletter.

This publication contains the latest news from Met-Chem, Poly Products and Samsco. Some features include equipment and product information as well as general and technical information that we hope you will find useful.

If you have any questions on any of the information presented, ***please contact us at 216-881-7900****.*

INSIDE THIS ISSUE:

FILTRATION FABRICS—MET-CHEM, INC.

Submitted by: Walter Senney, Met-Chem Group President

One of the most popular fibers used to manufacture fabric today is polypropylene. It can be woven into a variety of thread counts to allow from loose to tight filtration applications. Polypropylene is good for use in temperatures from 50^0F to 180^0F (Specification charts show use up to 250^0F under limited applications is acceptable, but I would not recommend it). The acceptable pH range for products filtered with polypropylene material is 2-12.

Polypropylene can be woven in the following ways:

- *Multi-filament* uses a number of fibers rolled together prior to weaving the cloth. This allows for a smooth finish and normally tight filtration. This cloth is normally used for filtration in pressure leaf filters for chemicals, liquid foods and some lower solids waste water; as well as for anode bags in plating applications.

- *Mono-filament* uses a single fiber (like fishing line) to weave the cloth. This allows for a slick non-absorbing cloth that can be used in the same applications as multi-filament, but is normally not as tight for filtration. This type of cloth works well for screening and more open filtration applications.

- *Mono/multi filament blend* is a cloth woven out of both fibers, one is woven in one direction, while the other is woven in the other

- direction. This cloth can give us the best of both worlds in terms of tight filtration and a slick face for ease of cake removal. One of the major uses of this cloth is on filter presses for process filtration and heavy solid waste water applications.

Felt is the needle punching of these fibers into a thick material used regularly for filtration of paints, coolants and a variety of liquids. Micron ratings can go nominally from 1-100. These felts can be supported by an internal scrim or they can be non-supported. The supported felts can hang from a ring to filter, while the non-supported must be put in a pressure vessel supported by a basket to avoid blowout.

This is just a thumbnail sketch of polypropylene textile cloths. These cloths can filter “the birds or the worms” depending on the type and tightness of the weave. For more information or samples contact Gwen Mendoza at gmendoza@metchem.com.

Future filtration articles will address other varieties of fabric, laboratory testing of filtration fabrics and process solutions and specific applications for these textile cloths.

ATMOSPHERIC EVAPORATION—POLY PRODUCTS

Submitted by:

Jeff Kubiak, VP of Sales Met-Chem/Poly Products

Let's start at the beginning. Since this is the inaugural news letter, why not start with what the Poly Products Evaporator is and how it got here. Future articles will delve into how it works and cover specific application:

The most popular piece of equipment sold at Poly Products Inc. is the ***ET-III-W™*** evaporator. The ***ET*** are the initials for simply ***E***vaporative ***T***ank, the ***III*** stands for the third design *(it's a roman numeral 3, not one, one, one)*, and the legendary ***W*** stands for Waste water. The ***W*** today is a bit of a misnomer; we use the ***ET-III-W™*** evaporator as the evaporator of choice for waste water applications as well as solution recovery / concentration applications.

The ***ET-II™*** evaporator was the first production based Poly Products evaporator. It replaced what was basically a hand made welded prototype evaporator in the early 1980's. The ***ET-II™*** evaporator was constructed of a one piece roto-molded virgin Polyethylene tub, yellow Blower Sleeve, and blue pyramid Vent Transition. These are the three components that make-up the main assembly of the evaporator. Unlike the ***ET-III-W™*** evaporator, the ***ET-II™*** evaporator relied on a packing inside the yellow blower sleeve to create surface area for the evaporation to occur. The ***ET-II™*** evaporator had 700 square feet of surface area from finned evaporative panels stacked neatly on the grid in the bottom of the Blower Sleeve.

The ***ET-III™*** evaporator had 1,000 square feet of surface area packed inside of the yellow blower sleeve. The ***ET-III™*** evaporator was just a larger version of the ***ET-II™*** evaporator. They have the same dimensions from the side, but the ***ET-III™*** evaporator is wider.

Both the ***ET-II™*** evaporator and the ***ET-III™*** evaporator were used on plating rinse water solutions so that the rinse water could be reconcentrated and reused as valuable plating solution. *(Future articles will talk about this technique and how it has become the norm in modern plating shops all across America and around the world).*

As the popularity of the evaporator grew, so did the creativity of the applications. It made sense that evaporation could help the smaller waste water generator reduce his waste water hauling costs. **"Why pay to haul water?"**. The evaporator was used to reduce the waste water volumes for countless industries, but in the first attempts, we found that the tight packing had small and easy to clog passage ways. The packing worked just fine in a ***plating line*** application, with a chemistry lab monitoring and filtering the bath, but when the evaporator was used on an application that was literally ***waste water***, and we would evaporate to the point of saturation, the evaporator would clog.

THE BIRTH OF THE ***ET-III-W™*** EVAPORATOR

The ***ET-III-W™*** evaporator has the same external appearance as the ***ET-III™*** evaporator; the difference is within.

The packing was removed. There are no finned evaporative panels inside the ***ET-III-W™*** evaporator. The small spray nozzles were removed and replaced with specially made large high flow nozzles. These nozzles have a ½ inch cross section at the smallest point. These large, wide-open passage ways are well suited to pass the solids that are typically in a ***Waste Water*** application.

The water spray forms many, many droplets inside the evaporator, where the packing formally resided. These many droplets create a tremendous amount of surface area. So much area, that the evaporation rate is actually better in the waste water evaporator, the ***ET-III-W™,*** than it was in the ***ET-III™*** evaporator. Further, without the cost of the old fashion "packing" the ***ET-III-W™*** evaporator also cost less money.

The ***ET-III-W™*** evaporator has become the choice evaporator for nearly every application throughout America and around the world. Why pay to haul water?

Poly Products

ET-III-W

Evaporator/

Recovery Unit

"Why Pay to Haul Water?"

SAMSCO EVAPORATORS

Submitted by:

Jason Verderber, Samsco

Samsco offers several evaporator controller options to meet the specific needs of our customers. The PLC controlled evaporators can be outfitted with features such as auto drain, auto oil management, auto antifoam injection, auto pH adjustment control, auto vapor recovery (condenser) systems. These are just a few of the features that can be added to a basic unit. All these options allow for minimal operator involvement, this automated subsystem will provide an excellent alternative to manual operation of the evaporator. In the coming months we will look at each of these controller options in depth. This month our focus will be on the auto antifoam injection system.

We all know for a fact that pure water does not foam during the boiling process. When foam does occur in the boiling process, this clearly indicates the presents of contaminants in the water. This should come as no surprise to anyone since we are dealing with wastewater. The degree of foam, type of foam and duration of the foam are all characteristics that must be understood in order to find a way to control the foam before it becomes a problem.

The basic Samsco control has an operating module that provides the user with constant monitoring of the boiling wastewater. This ensures continuous operational protection from boiling process upsets caused by foam formation. This constant monitoring is provided by a level sensor which is able to detect foam and react by sending a signal to Samsco PLC control to shutdown the heat source, thus stopping the foam.

The auto antifoam injection system goes one step further in providing hands free dosing of the evaporator contents by using an injection pump and a mixer. When the system detects foam, it signals the need for a small, predetermined amount of antifoaming agent to be inserted. Each evaporator cycle begins with the dose and if needed, more antifoam agent is added at each sign of foam recurring.

When the auto antifoam injection system is used along with the auto drain option the user is provided with true unattended operation. The foam-producing-wastes require an injection of the antifoam agent upon entrance of fresh waste after each drain cycle.

The auto antifoam injection system is not only available on new Samsco SWE-II Water Evaporator but it also can retrofit onto existing units as well. The system can easily be added to any existing evaporator by the user or by contacting Samsco client services to install the system. Samsco also carries five gallon pails and fifty five gallon drums of antifoam agent in stock for immediately delivery.

Next quarter we will discuss the Samsco Auto Vapor Recovery (condenser) system.

All of these options allow for minimal operator involvement... this automated subsystem will provide an excellent alternative to manual operation of the evaporator.

USED EQUIPMENT—

Submitted by: Luke Johnson

Hunting for used equipment can be the equivalent of searching for a needle in a haystack. When you're working with the industrial process, equipment needs to be engineered to fit the bill, so finding the right piece of used equipment can be a difficult task. Luckily I have a fairly extensive inventory to work with, and even more importantly a versatile staff.

Recently in April I received a request from a customer in Indiana. Their calcium modified zinc phosphate bath was building up solids, and they did not have the necessary equipment to deal with the problem. They needed to have something quickly; an eight week lead time would be too long. My objectives: The unit would need to be resistant to rust, the unit would need to be able to resist 190 degree Fahrenheit temperatures, and lastly the unit would need to maintain that 190 degree temperature so my customer would not be losing valuable energy. 190 degrees would cause a problem because most epoxy coatings would easily melt away at that temperature, inside and out. Secondly, your run of the mill fiberglass insulation would never stand up to the test of time in a corrosive and industrial environment.

Luckily I had the perfect solution. In stock we happened to have a 30 GPM stainless steel clarifier. The unit was acid washed and ground free of calcium build up off of the plates and the inside. This was repeated with several power washes and a final buffering. The lid was replaced, closing mechanisms were installed, and the flanges were capped. Several plates needed to be re-welded to maintain its structural integrity. Then carbon steel legs were fabricated, and epoxy coated. These legs were then bolted to the clarifier to replace the missing ones. Once the structure was in tip-top condition, steel prongs were welded to the exterior to hold in place custom sheets of industrial fiberglass insulation. Each fiberglass sheet was carefully cut to fit desired spaces, and then every seam was covered with special foil-backed tape to maintain the heat. The fiberglass would need to fit everything including the lid to maintain the desired 'r' value. Finally, the clarifier was wrapped in shrink-wrap in preparation for shipping.

One project among thousands, but a custom job is always exciting. My customer was able to successfully pump the zinc-phosphate solution into the clarifier and back into his bath without wasting valuable heat or corrupting his solution. The slurry gathered at the bottom of the clarifier could then be treated in waste treatment or pumped straight into a filter press. A job well done.

The next article discussed will be another custom job in the used equipment industry, and another common problem in the waste treatment industry: when a used filter press footprint is too large.

INDUSTRY NEWS—SUBMITTED BY, CHERYL BANASZAK

In August the National Association of Surface Finishers held the SurFin 2007 convention in Cleveland, Ohio. Over 1200 visitors viewed more than 220 exhibits and participated in various technical sessions over the two-day conference.

Next year's show will be held in Indianapolis, IN June 16-18.

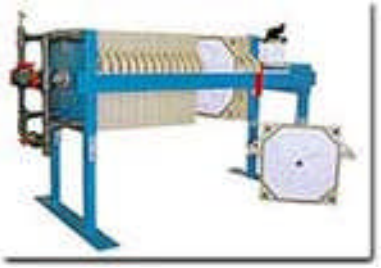
The 2008 Schedule of Events for the Metal Finishing Industry is as follows:

NASF Management Conference - March 2-6 – Cabo del Sol, Los Cabos, Mexico

Washington Forum – April 22-24 – L'Efant Plaza, Washington DC

SurFin 2008 – June 16-18, Indianapolis, IN

INSIDE STORY HEADLINE



Submitted by: Cheryl Banaszak, Met-Chem

Met-Chem discovers new use for Filter Presses!

As filter presses go, the basic operation is pretty straightforward. It is not a high tech process but it is practical from an expense and use standpoint. Filter presses are commonly used for filtering out solids from large volumes of wastewater and produce a condensed cake, thereby reducing the volume of sludge and also reducing disposal costs.

However, Met-Chem has recently discovered a new use for filter presses in the biodiesel industry. Met-Chem presses have been successfully used by a variety of facilities in the processing of biofuels by filtering out impurities that are commonly found in methyl esters

A synthetic adsorbent filter aid ensures biodiesel quality by removing contaminants within methyl esters. Removal of these contaminants ensures the biodeisel producer that the fuel produced meets industrial standards and ASTM D-6751.

Filter Press Operational Overview:

The incoming solution enters into the filter press via the center feed pipe. When the plates are closed, the cavity between the plates is the space where the sludge is captured. The filtered water exits through the filter cloth and works its way to either the left upper and lower corners, depending on whether it is a one button or a three button plate. The one button exits on the opposite side that the three button exits.

The reason for this is to provide proper air flow through the filter cake. When the filter press is full, the sludge chamber is full of sludge. When the three ball valves on the outlet manifold are closed, and the inlet center feed ball valve is closed, the air that enters the filter press via the small ball valve on the upper left hand corner of the manifold is forced through the filter press.

Because of the porting denoted by the one button or the three button plate, the air enters into the sludge chamber via the upper left hand corner of the three button plates, and exits via the bottom right hand corner of the one button plates. This process will push excess water out through the outlet manifold. Think of this a wringing out the sponge.

Because of this porting sequence, care must be taken to maintain the 1-3-1-3-1-3 alignment of the plates.

When expanding with additional plates, remember to always add plates in even numbers, half one buttons and the other half three buttons.

Once the sludge blown down process is complete, the filter press is ready to be opened. To open the automatic filter press, reverse the air valve on the automatic pump to allow the pump to slowly pull open the pushing plate. On the smaller manual units, simply release the ram pressure by opening the release valve and the pushing plate will be pushed back via an internal return spring.

Now that the plates are released, the plates must be indexed one by one. As this occurs most of the sludge will fall into the sludge dumpster. A sludge spatula is provided on new Filter Presses to aid in the sludge removal. Care should be taken to ensure that the cloths are in tact and the o-ring and o-ring sealing surfaces are in position and free from obstructions.

Once all plates are clean, the filter press is ready to be closed hydraulically. The three outlet manifold ball valves should be opened, the center feed pipe should be opened and the pump is ready to be turned on to begin the next cycle.