

# MET-CHEM GROUP NEWS

FEBRUARY 2008  
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## FILTRATION FABRICS—MET-CHEM, INC.

Welcome to the second 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.**

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*Submitted by: Walter Senney, Met-Chem Group President*

In the last issue I wrote about one of the more popular fibers used to weave filtration fabric, polypropylene. In this issue I would like to discuss another one of the more regularly used fibers in manufacturing fabric, polyester.

Polyester is woven and used in some of the same similar ways polypro is, from tight to open weaves, but it can handle higher temperatures.

Polyester is safe to use in temperatures from 50 to 250 degrees F. (Specification charts show use up to 300 degrees F under limited applications is acceptable, but I would not recommend it). The acceptable pH range for products filtered with polyester material is 1-9. This allows the safe use of polyester in lower pH ranges and higher temperatures than polypro, but it can not handle higher pH like polypro can.

- *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.

- *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.

As a general rule, multi-filament Polyester fabric is used in lower micron retention ratings for filtering lower pH solutions where polypro would be at the bottom of it's pH range, but it does not hold up as well when the pH gets too far above 9. It is used in the monofilament form where easy cake release is required and can also be used where a more open fabric is specified for sifting and screening applications.

This is just a short overview of polyester and it's uses in the filtration industry. Like polypro it can come in a variety thicknesses, weaves and micron ratings to fit different applications. For more information or samples contact Gwen Mendoza at [gmendoza@metchem.com](mailto:gmendoza@metchem.com).

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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

In our previous quarter's news letter, we reviewed the evolution of the Poly Products Evaporator, the **ET-III-W EVAPORATIVE TANK**. If you did not receive this issue, you can find it on our web site at [www.metchem.com](http://www.metchem.com) and then click on [Met-Chem News Items](#) then [Met-Chem Newsletter](#). Or you can go directly to the news letters via [http://metchem.com/MC%2520News11-1\[1\].pdf](http://metchem.com/MC%2520News11-1[1].pdf).

This news letter will introduce you to the *companion* of the Poly Products Evaporator: the **ET-Companion™ CONDENSER**. To fully understand what the **ET-Companion™ CONDENSER** is doing, let's first dig a little deeper into what the evaporator is doing.

The **ET-III-W EVAPORATIVE TANK** will evaporate water into the air stream that is passing through the unit and produce humid air, very much like a clothes-dryer at home. This humid air is then ducted out of the building, again just like the clothes-dryer at home.

As discussed in the last news letter, the air enters the evaporator and comes in direct contact with the solution droplets and absorbs water. The objective is to saturate the air, or make it 100% humid; the *actual water* content will vary based on the temperature of the air, thus the term "*relative humidity*". The warmer the air, the more water it can hold. In round terms, for every 20°F the air temperature is increased, the water holding capacity of the air is doubled, or you could say that the relative humidity is cut in half. Heating the solution will in-turn heat the air and increase the evaporation rate, *this will be included in a future News letter*.

Now the 100% humid air exhausting from the **ET-III-W EVAPORATIVE TANK** can be ducted out of the building, as previously indicated, or it can be ducted into the inlet of the **ET-Companion™ CONDENSER**. The **ET-Companion™ CONDENSER** will cool the air, which will in turn reduce the amount of water the air can hold and condense the water out of the air stream. Inside the **ET-Companion™ CONDENSER** is a big specially made radiator, or *Coil*. This Coil is usually feed by a *cooling tower* or a *chiller*, or some other cold water source. As the warm humid air passes through the Coil, the air is cooled. Just as a cold drink appears to be *sweating* on a hot summer day, the Coil is dripping with condensate beads of distilled water. The beads of water drop down to the bottom of the Polyethylene tub of the **ET-Companion™ CONDENSER**. As the distilled water accumulates it will drain out of the 1" FNPT port in the bottom.

The same rule applies to cooling the air as described for the **ET-III-W EVAPORATIVE TANK** : In round terms, for every 20°F the air temperature is decreased, the water holding capacity of the air is cut in half, or you could say that the relative humidity is doubled, so the water is *condensed* out of the air.

With the **ET-Companion™ CONDENSER** working with the **ET-III-W EVAPORATIVE TANK** the system is now a completely closed loop air system. The cool dryer air that is exhausted from the **ET-Companion™ CONDENSER** is then ducted back into the inlet of the evaporator. This air is still actually at 100% humidity, but it is holding far less water at the cooler temperature. Once the air is in the **ET-III-W EVAPORATIVE TANK** and again exposed to the warm solution droplets, the air heats up and then has plenty of room for new water to come on board.

There are many benefits to the **ET-Companion™ CONDENSER**, but the three major benefits are as follows:

- Recovers all the water that is evaporated and returns it back to the end user for reuse in the form of distilled water.
- No more holes in your roof for exhaust ducting. No need for permits from the Air Quality People; this is a completely closed air system.

Eliminates the need for air make-up in you building; no air is exhausted.

For more information, e-mail: [jkubiak@metchem.com](mailto:jkubiak@metchem.com) or call 216-391-POLY



Poly Products  
ET-III-W  
Evaporator/  
Recovery Unit

“Why Pay  
to Haul  
Water?”

Any one of the above reasons is merit enough for considering the **ET-Companion™ CONDENSER**, and we have helped many End Users realized their goals in one or more the above areas, while the other benefits are just icing on the cake; and who doesn't like cake.

## SAMSCO EVAPORATORS

*Submitted by:*

*Jason Verderber, Samsco*

Samsco offers several evaporator controller options to meet the specific needs of our customers. In the last issue, we looked at the auto antifoam injection system. This time we will be taking a look at the Samsco Auto Vapor Recovery (Condenser) System.

The Samsco condenser system is used to return clean, distilled water to the wastewater generating process or wherever regulations require closing the water-usage loop to meet environmental objectives. Samsco uses a plate and frame style condenser system. The design allows for higher temperature coolant usage, thus reducing cost and eliminating fugitive emissions.

Wastewater is feed to the evaporator by means of a pump controlled by Samsco auto-fill level control. Using a fuel source of your choice (options include low-pressure steam, natural gas, liquid propane, and electricity), the waste is brought to a vigorous boil at normal atmospheric pressure. As boiling occurs, the wastewater emulsions separate into concentrating contaminants and environmentally clean water vapor (steam). The expanding steam generated in the evaporator passes through the Samsco mist eliminator by virtue of its own pressure, and enters the plate-and-frame style condenser module. The mist eliminator system prevents carryover of non-volatile components by removing more than 99% of all droplets as small as 10 microns. The evaporator is equipped with a pressure relief system so that steam pressure inside the boiling chamber cannot exceed 20 inches of water column.

A cooling water source, which can be a chiller, cooling tower or dry air cooler, is required to remove the BTU's from the steam in the condenser, thereby causing a phase change back to water (distillate). This distilled water is then fed, by gravity, to a small onboard, distillate receiver tank, from which it is pumped to its process-feed storage point.

In the gas-fired evaporators, the generated steam vapors leave the evaporator totally separate from the combustion gases. The distillate water, thus, is not contaminated with combustion products. The exhaust pathway for combustion gases is totally sealed, all the way from the burner to the top of the evaporator's exhaust stack, safely outside the building. System users are never exposed to the exhaust gases.

The Samsco condenser systems allow users 100% reclamation of water vapor distilled for re-use. The distillate is free from contaminated combustion by-products. The system also meets regulatory requirements for closed-loop systems. The system applications include sensitive waste handling situations like low-level radioactive waste.

For more information on the Samsco condenser systems or any other of the available options for the Samsco Water Evaporators contact the sales team at 603-668-7111.

**For more information, e-mail [jverderber@samsco.com](mailto:jverderber@samsco.com)**



**“Return clean, distilled water to the wastewater generating process or whenever regulations require closing the water-usage loop to meet environmental objectives.”**

Submitted by: Luke Johnson

As many of you may already know, one of the common problems with buying used equipment is whether or not the piece will fit! Footprints, overhead clearance, space for maintenance. All of these obstacles can quickly shoot down a purchase. However, whenever you're working with Met-Chem, Inc., there are solutions!

Just this past year we came across just such a case, a large filter press which was the perfect capacity and design for our customer's purchase, but too large for their concrete supports. These concrete supports were 11' across at the widest, and raised the filter press to dump into a roll-off container. The filter press available had a footprint that had cast iron legs that were 11'6" at the widest. Building or modifying the existing concrete supports were more than what our customer wanted to spend for this project, so Met-Chem needed to find a solution. Not only did we need to find a solution, but the project needed to be done in 4 weeks! Our standard lead time for a filter press this large would be at least 6 weeks to put in the necessary time and excellence we demand for our reconditioning process.

The solution was simple, yet inventive. (Always the best kind). The filter press incorporated the notched sidebar design to hook onto the ends. The notch in the sidebar, and the cast iron piece in the end would match perfectly, and then be bolted down with another slab of steel. The solution was to carefully support the ends and unbolt these sidebars. Then the steel was shipped out and professionally milled to bring the notch in 6 inches on each side. This would successfully and cost-effectively shorten the footprint of the filter press. The steel was then shipped back, and installed on the ends. The old notch was filled in, and the reconditioning process on the steel would begin. While the sidebars were out, the filter plates were already being power sprayed and buffed clean. New filter cloths were being sewn and the end plates were being buffed to begin painting. When the sidebars returned the full clean up process would be finished, the hydraulics would be inspected, tested, repaired, and tested again to full hydraulic capacity. The filter press would be prepped for paint, spray-coated with a blue epoxy, and then allowed to sit. A flatbed was ordered in and the large shortened filter press was shipped: on time!

Another efficient and excellent piece of equipment was cleaned up and made ready for another happy customer. Used pieces of equipment are not the simplest animals to work with, but there always is a solution. Next article will discuss what do to when a filter press is the right size, but maybe not the right capacity.

**For more information, e-mail [ljohnson@metchem.com](mailto:ljohnson@metchem.com) or call 216-881-7900.**

## **INDUSTRY NEWS—SUBMITTED BY, CHERYL BANASZAK**

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

#### **Engineering:**

SME- Lean for the Supply Chain – March 12-13, 2008 – Crowne Plaza Hotel, San Jose, CA. *For more info, please go to [www.sme.org](http://www.sme.org).*

SME – Advanced Manufacturing Expo – March 26-27, 2008 – International Centre, Mississauga, Ontario, Canada. *For more info, please go to [www.sme.org](http://www.sme.org).*

SME – WESTEC 2008 Exposition & Conference – March 31-April 3, 2008 – Los Angeles Convention Center, Los Angeles, CA. *For more info, please go to [www.sme.org](http://www.sme.org).*

#### **Metal Finishing Events:**

NASF Management Conference – March 2-6, 2008 – Cabo del Sol, Los Cabos, Mexico

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

SurFin 2008 – June 16-18, Indianapolis, IN – Indiana Convention Center

*For more information on the Metal Finishing events – please go to [www.nasf.org](http://www.nasf.org)*

#### **Engineering:**

#### **Filtration Events:**

March 25-29, 2008 Water Quality Association – Aquatech USA 2008 – LasVegas, Nevada. *For more information, please visit: [www.wqa.aquatech.com](http://www.wqa.aquatech.com).*

## INSIDE STORY HEADLINE

Submitted by: Cheryl Banaszak, Met-Chem

### Save \$\$\$! Dry your sludge!

Your sludge volume is increasing. Disposal costs are on the rise. Your filter press is running around the clock at capacity. Maybe it can keep up with the load but maybe you need to look at adding another press. The bottom line that you cannot ignore is no matter how you keep up with the sludge being generated, you still have to pay to haul it away.

As a general rule (for most metal hydroxide wastes) a filter press can reduce wastewater volume by 20:1. For example if you have 80 barrels of wastewater, and run those through a filter press, you will end up with four barrels of filter cake. You are still paying to haul a good amount of water. How can you reduce disposal quantity *and* cost? Enter the sludge dryer.

A sludge dryer that is designed to work specifically with a filter press can reduce sludge volume by as much as 4:1! In looking at the example cited above you could reduce 4 barrels down to 1.

Dryers are made in any a variety of heat sources to meet any application, whether it's steam, gas or electric. Dryers can be batch style - sized in accordance with your filter press size or they can also be continuous. Meaning that you can continually add sludge as the drying cycle commences.

If space in your shop is a concern, a batch-style, under-the-press design might work best for you. This type of design allows the dryer to sit underneath the filter plates as a dump cart. However, unless the dryer and press are on risers or elevated platform, the dried sludge will need to be transported via a conveyor to a roll-off container.

For information on new batch sludge dryers, please visit our website at:

[www.metchem.com/filter\\_press.htm](http://www.metchem.com/filter_press.htm)

or

If you are looking for information on used sludge dryers in either batch or continuous models, please visit:

[www.metchem.com/used-sludge.htm](http://www.metchem.com/used-sludge.htm)

Or you can call 216-881-7900 to speak with a sales representative.

E-mail: [cbanaszak@metchem.com](mailto:cbanaszak@metchem.com)

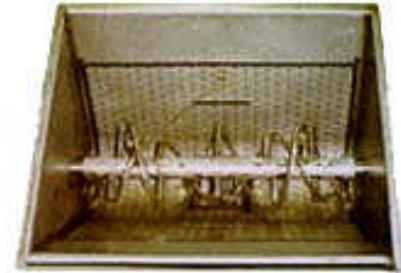
#### Calendar of Events Continued:

##### Filtration Events:

March 25-29, 2008 Water Quality Association – Aquatech USA 2008 – LasVegas, Nevada. For more information, please visit: [www.wqa.aquatech.com](http://www.wqa.aquatech.com)

April 14-18, 2008 – World Filtration Congress – Congress Center Leipzig, Leipzig, Germany. For more information, please visit: [www.wfcio.com](http://www.wfcio.com)

May 4-7, 2008 – IEST – 54<sup>th</sup> Annual Technical Meeting & Expo – ESTECH 2008. Hilton Chicago/Indian Lakes Resort, Bloomingdale, IL. For more information, please visit: [www.iest.org](http://www.iest.org).



Stainless Steel Wetted Parts of  
Met-Chem Sludge Dryer—with  
Steam Jacket



Continuous Sludge Dryer



Met-Chem Batch-Style Sludge  
Dryer