Water Wash Paint Spray Booth Sludge Removal, Water Curtain Paint Wastewater Treatment, Paint Sludge Separation and Dewatering, Paint sludge removal centrifuge, Palin paint sludge dewatering

Since 1991 water wash spray booth paint sludge recovery has been one of US Centrifuge's most common and successful applications with many installations throughout North America. It requires knowledge and experience to properly move paint solids to the point of extraction where they can be collected and fed to the centrifuge for separation and removal. We have unequalled application expertise when it comes to properly applying a centrifuge to water wash spray booths along with the widest range of machine models and capacities available.

Centrifugal separation equipment can be designed to fit your particular needs, from a single water wash booth to several. We can inform companies on the newest ways to improve booth efficiency and how to effectively remove paint sludge and other particles from paint booths and washers. By correctly integrating the booth design and paint sludge system it is possible to greatly increase the booth efficiency plus reduce downtime and maintenance. We can assist with and / or completely design paint sludge recovery systems for new and existing paint installations.

Centrifugal sludge removal systems should strongly be considered when the following conditions exist with a water wash spray booth:

- Frequent maintenance down time associated with paint sludge
- Extra working shifts cleaning or making up production for booth downtime
- High cost of contaminated booth water and / or wet sludge removal and disposal

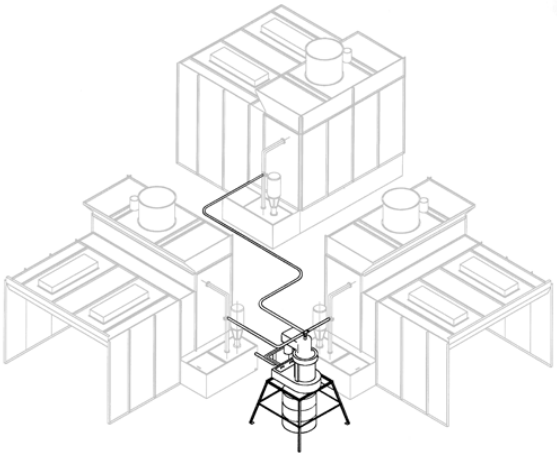
Three important steps to achieving the desired results:

1. Correct sludge system design for the booth and centrifuge application
2. Selecting the right centrifuge model to effectively handle the paint load
3. Proper chemical program applied for the specific paint type and usage

We can help you with all three steps to insure a successful installation

Additional sludge recovery system and centrifuge benefits:

- Reduces disposal costs
- Recycles booth water
- Extremely low maintenance
- No filters or consumables
- Works with virtually all chemical treatment programs
- Very few moving parts
- Durable construction
- Low utility requirements
- Simple to operate



Consider the following information:

- Total number and water volume of booths
- Current maintenance program
- Chemical supplier and costs
- Estimated annual disposal costs
- Percent solids of paint in use
- Approximate transfer efficiency
- Paint use in gallons per day

Paint Sludge Discharged From Centrifuge

CASE HISTORY:
Paint de-tack program using centrifuge as the solids control and removal system
ACCOUNT:
Manufacture of diesel engines
PAINT TYPE:
Water base paint using water miscible solvents
PAINT LOAD:
Spraying 100-gallons of paint per day
TRANSFER EFFICIENCY:
50%

DESIGN:
Very old recovered downdraft paint booth built by George Koch & Sons. Manifold pipes delivered water spray to the eliminators using fan spray jet style nozzles. The sump is located directly below the floor grates and has a rectangular shape with side extensions and a flat bottom. A vertical re-circulating pump is installed in a pump well box attached to the side corner of the sump tank. The water draw to this pump came from the area near this corner. No other sump agitation was present and most of the water in this sump was "quiet". The system lacked any paint recovery system. They started with a manual spray operation painting 230 engines per day and later invested in robots that helped increase production to 300 engines per day.

PROBLEMS:
Water-based paint saturating the booth water.
Manifolds constantly plugging up with paint solids.
Heavy paint sludge build-up in the booth sump pan.
Exhaust stacks and fans blocked up with paint solids. It was so severe that they had to cut bypasses in the roof exhaust stack before the fans to relieve the overload.
High production levels limited the maintenance time on the booth, however the stacks and fans were being cleaned once per week, and the sump was being manually shoveled out every three to four weeks.
Once the original retrofit designs were in-place an automatic centrifuge system was installed, but a competitor implemented the wrong paint kill program and no paint solids were being removed.

SOLUTIONS:

1. Modified the booth pans to eliminate "dead areas" of booth water agitation.
2. Mass water flow system was designed below water surface in sump pan to "drive" the suspended paint particles to the centrifuge pick-up point.
3. High efficiency manifolds with less clogging spray nozzles installed.
4. Main booth exhaust fans were upgraded.
5. A larger more efficient automatic centrifuge was installed when increased engine production added excess solids to the system.
6. Replaced our competitor's polymers with our paint kill polymer program and immediately started to remove paint solids from the booth water. Utilized the proper polymer for charge neutralization, which broke the paint molecule from the water and coagulated it into the proper micron size for improved centrifugal separation.

RESULTS:

Sump clean outs scheduled only once per year now.
Exhaust fans, stacks, and booth manifolds are remaining sludge free.
Successfully removing paint solids, generating one drum of dry land fill able solid waste every day and a half.
Very little maintenance time (clean-ups) devoted to downdraft paint booth. Only maintenance is floor grate, robot and good quality preventative maintenance.

- **LESS BOOTH MAINTENANCE**
- **DRYER SLUDGE CAKE**
- **REDUCED SLUDGE VOLUME**
- **MORE PRODUCTION**
- **CLEANER EMISSIONS**
- **REDUCED OPERATING COST**

CASE HISTORY:
Paint de-tack program using centrifuge as the solids control and removal system

ACCOUNT:
Manufacture of metal roasting pans

PAINT TYPE:
High solids baking enamel mostly black with white and other colors.
Black is an acrylic/melamine resin and all others are polyester/melamine resins.

PAINT LOAD:
Spraying 20 gallons of paint per day.

TRANSFER EFFICIENCY:
40%

DESIGN:
Initial operation was a standard "E" Style water wash spray booth with a manual centrifuge. A Company in Milwaukee, Wisconsin did original modifications to the spray booth. These modifications involved trying to efficiently remove the paint particles. However, they fell short of properly retrofitting the sump pan and directing the water flow for optimum paint particle suspension and centrifuge removal. Basically they placed a pump at the backside of the booth with a bottom center paint booth pick-up point, which fed the manually cleaned centrifuge located in a remote location approximately 15 feet from the booth. Three automatic paint spray guns are operating in a fixed position spraying the product (pans). These guns are scheduled to "fire" well in front of the pan and continue spraying paint until the pan clearly passes through the spray pattern. The pans are mounted on a pedestal on top of a conveyor chain. As the pans entered the spray booth the pedestal's rotated for total paint coverage of each pan and accompanying lid.

PROBLEMS:
Half of the paint over-spray was building up well short of the water on an extended pan located directly in front and below the chain conveyor line. The operator was flushing off this mass of "live" paint with a hose directly into the booth sump at the end of his shift. Plugging of the upper water spray manifold occurred since it was impossible for the polymer to de-tackify these "globs" of paint, thereby releasing live paint solids up the stack and onto the roof and surrounding neighborhood. Partially dead paint made the manual

centrifuge hard to clean resulting in operators letting the unit fill-up and not cleaning it until end of day. Excess paint solids accumulated in paint booth falling into bottom areas of the pan, eventually filling booth up with "sticky" paint sludge. The centrifuge was drastically under-sized for this operation and filled up within two hours, making proper clean-outs impossible. Large amounts of foam being generated from the high paint solids content in the booth water required large amounts of de-foamer to control this situation. The booth had to be entirely cleaned-out every four weeks resulting in 4 operators working costly non-production 10-hour days consuming 40-man hours. 18 drums of "live" paint sludge were generated at a sludge disposal cost of $400.00 per drum.

SOLUTIONS:

Added a short water flood sheet to the front of the booth directly below the conveyor chain in order to catch all of the over-spray as an atomized paint particle.
Replaced the upper standard metal pipe manifold with a new high efficiency PVC unit.
Replaced the manual centrifuge with an automatic centrifuge.
Set-up automated chemical feed with in-line draw down tube installed.

RESULTS:

All paint over spray entering booth water as an atomized spray paint particle.
No more "live" clumps of paint solids.
No "live" paint particles up the stack.
Quick and thorough de-tackification of all paint solids from improved manifold.
Quick efficient removal of paint solids handled by automatic centrifuge.
The only manual labor requirement is changing the sludge drum when filled.
Sludge is relatively dry, compact and with no solvent content.
The sludge is now landfill disposable at a much lower cost.
Booth is now cleaned-out once per year, yielding no drums of "live" paint sludge.

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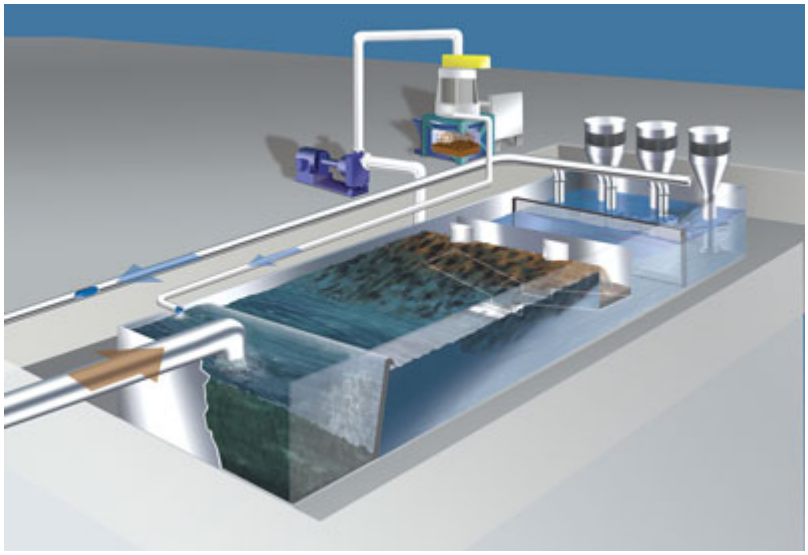
Sludge Recovery for Large Automotive Style Paint Systems:

This next generation Mass Flow™ Sludge Removal System is superior for use in higher volume water washed paint spray booth applications. These systems incorporate centrifugal removal and sludge dewatering and successfully correct traditional inadequacies. The sludge system can be designed to remove the de-tackified paint whether it floats or sinks as well as other water based sludge producing environments.

The maintenance-free system and method remove spent paint, recycling 60 to 80% of the water and the de-tackifying chemical back into the system for reuse, which keeps the system entirely clean for prolonged periods without sludge buildup even during downtime. The system produces a residual cake for disposal having very little moisture with much less weight.



This Sludge Removal system and method provide close, constant monitoring and excellent control of the water level in the recovery tank. With an optimum water level and proper chemicals for coagulation, the spent residue or paint flotation is maintained and the water flow in the tank is continuous. The tank cannot be blocked with sunken sludge and has proven to be a key factor in the success of the system.

The main components of this patented system include the sludge removal tank, centrifuge, agitation equipment and controls. An optional scavenger pump can be added to remove large chunks of residue or paint sludge prior to entering the chemical tank. Tank agitation through proper pumping action helps increase centrifugal efficiency, the next phase of the system.

Mass Flow™ Success Story: Like many manufacturers, a major Truck Manufacturer faced a problem when production volumes increased. Their paint booth system was originally designed for painting approximately 50 chassis per day, but increased demand required output to be 76 chassis per day. The equipment used to recover paint sludge from their paint booths no longer kept up with production volume. They chose the patented

"Mass Flow" System, which has proven to dramatically reduce costs in labor, water consumption and chemical use. Design and installation was completed in less than 3 months. Once installed, it only took a few hours to get the system up and running. After more than 12 months on-line, the 'Mass Flow' system has eliminated all traces of sediment in the water pits. This has exceeded the Truck Manufacturer's ambitious goals of reducing the pit cleaning task to once every 6 months. With this 'Mass Flow' system, the Truck Manufacturer expects to clean annually, and only if needed. In addition to labor savings because of reduced cleanup, money has also been saved on chemicals. "The centrifuge is so efficient, we don't need a lot of extra chemicals to coagulate the residue or paint. And, this system virtually eliminates clogging."

An initial cost analysis has demonstrated an annual savings of nearly $100,000.

To learn how US Centrifuge can help you design a proper paint sludge recovery system or solve an existing paint sludge problem please contact us: Call toll free 800-899-2040 or 317-299-2020 and we will refer you to one of our paint sludge recovery specialist.

Or e-mail Scott Behrens directly at sbehrens@uscentrifuge.com

US CENTRIFUGE®
The Liquid-Solid Separation Experts

4011 Championship Drive
Indianapolis, IN 46268
800-899-2040

Water Wash Paint Booth Application Questionnaire

Company		**Contact**	
Address		**Phone #**	
City		**Fax #**	
State & Zip		**E-Mail**	
Product Manufactured			
US Centrifuge Representative		**Date**	

Application Information

Booth Style and Original Manufacturer	Water volume in booth or pit	Robot or manual	Paint type	Gallons of paint sprayed per day	Paint solids	Transfer efficiency	Production hrs per day
1.					%	%	
2.					%	%	
3.					%	%	
4.					%	%	
5.					%	%	

Chemical Supplier		**Chemical Rep**		**Phone #**	

Chemical Treatment Program	**None**	**Floating**	**Suspend**	**Sinking**
Describe the booth agitation				
Current method of booth or pit filtration				
Current method of solids de-watering				

Sludge volume generated per day		**Sludge dryness**	**%**
Sludge classification	**Hazardous**	**Non hazardous**	**Other**
Sludge disposal method	**Landfill**	**Incineration**	**Other**
Sludge disposal cost	**$ / month**		**$ / year**
Liquid classification	**Hazardous**	**Non hazardous**	**Other**
Liquid disposal method	**City sewer**	**Plant waste treatment**	**Other**
Liquid disposal cost	**$ / month**		**$ / year**

Goals and objectives of potential centrifuge installation: (please circle all that apply)

Reduce sludge volume	Reduce booth maintenance time	Reduce booth maintenance labor	Increase production up time	Increase production capacity	Minimize floor space requirements
Reduce sludge disposal costs	Reduce liquid disposal costs	Improve booth water quality	Reduce chemical costs	Eliminate filter media costs	Minimize handling costs

Other desired benefits	
Plant voltage	Available floor space and ceiling height

Please fax completed survey to US Centrifuge @ 317-299-2284 or call 800-899-2040