The Handy Pocket Guide to a Clean Shop

Cleaning & RP Fluids
STAGES
Master Fluid Solutions™

We all know that a clean work place has a lot of advantages. People feel better about their jobs. People are more productive. Customers (even auditors) get a better impression. And best of all, you don't track nasty stuff onto the boss' office carpeting.

Unfortunately, keeping a manufacturing shop clean doesn't happen without a bit of work and some good products to help out. Lubricants, grease, metalworking fluids, and lots of other soils come with the territory.

At Master Fluid Solutions, we've been "hands-on" helping our customers clean their machines and work areas for decades. So we thought you could benefit from some things we've learned, and though we may have added some humor along the way, we are serious about giving you some information that we hope you'll find useful.

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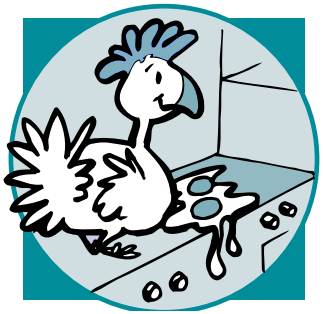
Types of Soil in a Manufacturing Shop

Dirt is dirt, right? WRONG. There are lots of different types of soil found in a manufacturing area. You don't find a lot of chicken fat or dried egg yolks (which many household cleaners are made to clean). But, you do find some hard-to-remove soils, such as:



- ✓ Oily soils – lube oil, straight-cutting, stamping, or drawing oils.
- ✓ Hard water residue or "metal soaps". These are usually found in and around machines running water-based metalworking compounds.
- ✓ Oil/particulate combinations usually found on floors and hard surfaces.
- ✓ Oily films – walls, windows, and lights.
- ✓ Metalworking fluid residues and bacterial or fungal scums often found in "hidden" areas of central systems or machine tool sumps.
- ✓ Greases, some "waterproof", show up a lot in rebuilds of drives, pumps, motors, and the like.
- ✓ Varnish and carbon buildup often are seen on really hot surfaces or in rebuilding engines or burners.

T.A.C.T.

To get these soils off surfaces you have to have **T.A.C.T.** – a combination of:

Time
Agitation
Chemical action
Temperature

All four of these elements work together as a team. So, if you cut back one, you have to make it up in one or more of the others.

Example: You change the oil and filter in your Lamborghini Diablo, and having forgotten to wear your white gloves, you get a bunch of nasty, dirty, used oil on your hands and under your fingernails. Oh no! What to do? Well, when you go to clean up – what would the result be if:

- ✓ You only wash for a half-second? **(Time)**
- ✓ You don't rub and scrub? **(Agitation)**
- ✓ You don't use hand soap or cleaner? **(Chemical action)**
- ✓ You use ice water? **(Temperature)**

See what we mean?

Cleaning Metalworking Machinery

If you want to clean out a machine tool sump so you can recharge with fresh metalworking fluid, then this is the section for you. (If you just want to clean exterior parts of machinery to make it look better, check out page 14 of this booklet.)

It would be really easy to clean out machine sumps – except for all those parts that are so hard to reach. You can't use heat, you can't use really aggressive chemicals, and you can't scrub parts you can't reach.

Things you need to do a good machine clean-out are:

- ✓ a specialty machine cleaner like Master STAGES™ Whamex™ or Whamex XT™ (Use Whamex with emulsions; use Whamex XT for synthetics and semisynthetics to avoid foaming.)
- ✓ advanced planning

OR

you can do it the old-fashioned way – using lots of time, labor, and elbow grease.

Machine Cleaning T.A.C.T.

The **T.A.C.T.** equation for machine cleanouts looks like this:

T + A + C + T = CLEAN

- ✓ **TIME** – Machine downtime is really expensive (and so is direct labor). So, minimize your downtime by using Whamex or Whamex XT while the machine is still running production.
- ✓ **AGITATION** – It's almost impossible to get in and scrub out all those hidden areas, coolant lines, pumps, and such.
- ✓ **CHEMICAL ACTION** – This is the most important part of machine cleaning. That's because the other parts of **TACT** are so limited. Your cleaner has to attack the oils, bio-films, scums, and other nasty stuff quickly and at low temperatures. At the same time, it can't attack machines, machinists, or the parts being made.
- ✓ **TEMPERATURE** – When machine cleaning, you're pretty much limited to "room temperature." It can be worse if you are using cold tap water to charge up.

Checking Whamex or Whamex XT Compatibilty

Just follow these four easy steps:

1. Take a sample of coolant from the machine sump into a clean, glass jar with a tight lid.
2. Add Whamex or Whamex XT to the sample in the right ratio.
   Example: A one-quart moonshine jar, two-thirds full, would take about 1 oz. (small shot) of Whamex or Whamex XT concentrate to be at 5%.

3. Shake up this mixture and see how much foam you get. (You may need to add Master STAGES CLEAN DF1 to your central system if it is really foamy.)
4. Let the sample sit overnight and see if it looks the same the next morning. If it doesn't, contact your Master Chemical representative.

Cleaning Central Coolant System Considerations

Cleaning out a central system is a big job that you don't want to do very often. Keep central system cleanouts to a minimum by making sure you do a complete job with the right cleaning products.

We recommend:

✓ Before you start, make sure you have a "high-speed connection" to your local water company (not to the Internet). Do you know how long it takes to fill a 45,000-gallon central system with a half-inch garden hose? **Answer:** Longer than you will remain employed if you try it. (Six days plus six hours at five gallons per minute.)

✓ Have your maintenance people scheduled so they can inspect and repair pumps, valves, and other parts of the system while it is empty. It's sometimes good practice to replace seals and packing even if they are not leaking – yet.

Preferred Cleaning Method

Follow these directions for a thorough cleaning of your machine tools and central systems

1. Add 1%-3% Whamex or Whamex XT into the machine sump and run machine as normal for at least 24 hours or more for best results. If the machine runs high pressure through-the-tool for significant amounts of time, the cleaner may cause some foam, so keep a defoamer, such as CLEAN DF1 or TRIM® TC 239, available during this process.
2. After the Whamex or Whamex XT has circulated for at least 24 hours, pump out the sump and remove all chips, sludge, residue, and swarf. Remember to clean out overflow areas and flumes.
3. Spray down the machine with a 10%-15% Whamex or Whamex XT solution using The Whammer™ or a general purpose garden sprayer. Scrub out the chips, sludge, and any other residues from all interior, exterior, tool changer areas including high-pressure sumps and filter canisters.

4. When possible, pull out the sump and remove the conveyor, and clean all surfaces of the sump and conveyor including screens, covers, and pumps with a 10%-15% Whamex or Whamex XT solution. When complete remove all fluid, chips, swarf, grime, and sludge.
5. Fill the sump with enough water to circulate the pumps and mix in 3%-5% Whamex or Whamex XT. Circulate this cleaning solution through the coolant system for 30-60 minutes.
6. Replace conveyor and sump; rinse the machine with water and 1.0% TRIM coolant for rust protection, and circulate mixture through the coolant system for 10-30 minutes.
7. Pump out the rinse water as dry as possible and recharge with fresh TRIM coolant at the designated concentration.
8. After circulating for 30 minutes check the concentration and make the necessary adjustments to insure the TRIM coolant is within the designated concentration range.

Quick-Clean Method for Interim/Noncritical Cleaning

1. Add 1%-3% Whamex or Whamex XT into the machine sump and run machine as normal for at least 24 hours or more for best results. If the machine runs high pressure through-the-tool for significant amounts of time, the cleaner may cause some foam, so keep a defoamer, such as CLEAN DF1 or TRIM® TC 239, available during this process.
2. Using The Whammer, scrub down the machine including the inside, tool changer, exterior, and crevices.
3. Remove fluid sump and chip conveyor when possible and clean out all chips and swarf (Don't forget pumps, covers, high-pressure tanks, and filter canisters).
4. Replace conveyor and sump and rinse with 1% TRIM coolant for 10-30 minutes.
5. Remove 1% rinse fluid and recharge at specified concentration.
6. Check concentration with refractometer.

Using Pressure Washers, Foamers, & Steam Cleaners

Safety First!
High-pressure washers can produce lots of fine mist and overspray. The danger is that people can breathe it, get it into their eyes, and on their clothes and skin.

DO follow these few simple safety measures:

- ✓ Wear safety glasses and face shields.
- ✓ Wear chemical-resistant gloves and clothing.
- ✓ Don't use high-pH, caustic cleaners.
- ✓ Avoid breathing spray mists or, even better, use an air-supplied respirator.

DON'T use steam or high-pressure spray cleaners around motors, bearings, and electrical controls. Here's why:

- ✓ You can easily wash the lubrication out of motors or bearings in the process.
- ✓ Water and cleaner can mess up electrical controls.
- ✓ You may be shocked by the results.

Cleaning Hard Surfaces: Tools & Inspection Equipment

"Hard surfaces" include items such as bench tops, tool boxes, exterior parts of machine tools, hand tools, and inspection equipment. The most common types of soil are oily films, spills, handprints, and drips.

Larger areas such as painted walls, commercial vehicles, and trailers are often cleaned with a bucket and sponge or even a power washer. In these cases, make sure your cleaner chemical:

- ✓ Works as a dilution. (Most good products will work at 3% or less in a power washer.)
- ✓ Doesn't irritate workers' skin when diluted.
- ✓ Lasts a long time to minimize waste.

Most small area cleaning is done with spray bottle cleaners and a shop rag. When picking a cleaner for this type of job, consider the following:

- ✓ Is the cleaner fast-acting enough?
- ✓ Does it irritate the skin?
- ✓ Are there any toxic or restricted chemicals?
- ✓ Is the pH below 12.5? (Hint: It should be.)
- ✓ Does the cleaner cut the types of soil you have?
- ✓ Does it leave a sticky or tacky residue?
- ✓ Does it prevent flash-rusting on cleaned metal?
- ✓ Is it harmful to painted surfaces?
- ✓ Is it harmful to granite inspection tables?

Cleaning Windows, Lights, & Computer Monitors

Windows

Usually the big trick with windows isn't getting the dirt off – it's not leaving any residue of the cleaner behind. Industrial hard surface cleaners, such as Master STAGES Task2™ Grime Fighter, have a lot of surfactant and can leave a small amount of residue behind. You can't see it on machines, bench tops, or parts, but you can see it on mirrors or glass.

The answer is to use Task2™ Glass Cleaner.

Lights

The most important thing to remember when cleaning electric lights of any kind is to **KILL THE POWER!** Unplug pigtails, or for hard-wired lights make sure the hot side of the power is switched off. (A miswired switch can turn off a light, but still leave power on. If you're not sure, have a qualified electrician check first.) Then just clean with a light spray of Task2™ All Purpose Cleaner and wipe off.

Computer Monitors and Keyboards

It's definitely not a good idea to use a fire hose to clean off computer parts. We suggest using Task2 Glass Cleaner and a soft cloth. Spray the cleaner onto the cloth and then wipe down the monitor and keyboard.

Floor Cleaning

Floors

Just how slippery is a new floor cleaner? It's important to check before using a new product. Lots of cleaners, particularly "soaps," are really slick, and you don't want anyone slipping!

Office Floors (hard floors, not rugs)

Shiny surfaces like tile, linoleum, and terrazzo are usually not very dirty so they don't need a real high-powered cleaner. But you need something that will handle black-heel scuff marks and leave behind a shiny surface. Your best bet is to use Task2 Grime Fighter or Master STAGES SkidRid.™ For really tough scuff marks, use full strength in a spray bottle and pretreat, then go over the area as usual.

Factory Floors

Painted factory floors and lightly soiled concrete floors often are cleaned with a power floor scrubber or even mops. Pretreatment of tire marks with a spray bottle of concentrate makes cleanup easier.

Choosing the right Master STAGES product:

- ✓ CLEAN F2 is for in-plant floors with normal amounts of soil. It's worker-friendly, economical, and will handle most jobs out there with power to spare.
- ✓ SkidRid is for floors with tough tire marks and for floors where you want to leave behind a shiny surface.

If you have REALLY oily and/or greasy floors, you may need a high-powered, high-pH product like Skramex.™

Rebuild Cleaning

Let's look at maintenance shop rebuilding and cleaning of machine tools, gear reducers, CV joints, small engines, and the like.

The most common method of cleaning is to use a cold-solvent dip tank or a small solvent pedestal-type tank. If you can use solvent where you work (a lot of places can't because of air quality laws or safety regulations), and if you only have a **very** small volume of work, this may be the best solution for you.

In places where solvent is restricted, it is often replaced with a natural solvent or a hard-surface cleaner. Master STAGES CLEAN AMO™ "A maize 'N Orange"™ is a water-soluble, natural solvent cleaner made from corn and oranges. A good hard-surface cleaner is Task2 Grime Fighter – it's safer to work around, costs less, meets environmental regulations, and does a great job.

For high-production rebuild cleaning (as in rebuilding automotive or agricultural parts, gas meters, engines, or cylinder heads) a good combination of equipment and cleaner is needed.

Waste Minimization for Maintenance Cleaners

Waste Not!

The best way to keep waste problems down is to not make as much waste in the first place. Here are two good ways to keep waste water down to a minimum:

1. **Use high-quality cleaning products that last longer.** By using floor cleaner chemicals that wash twice as much floor area before running out of cleaning power, you end up with only half as much volume of dirty water. Sometimes, increasing the concentration of cleaner in your mop bucket or floor scrubber will let you cover more area, which may end up costing you less when you consider the cost of waste disposal.
2. **Recycle water so it can be used again in the cleaning process.** You can partially recycle mop water in a system using a XYBEX® Master Coalescer and a holding tank.

Once you make waste water, you have to dispose of it in a responsible manner. If you discharge waste to a local waste treatment facility (usually called a POTW), they can probably give some guidance on whether you can discharge spent cleaners to the sewer. In addition to you wanting to do the right thing, there are government laws concerning just what you can discharge.

There are some good ways to reduce the amount of waste you haul out or discharge:

- ✓ You can evaporate-off the water in the spent cleaner. Most times, spent cleaners will be at least 90% water. There are systems called “evaporators” which boil off the water so you will have much less volume to haul out. Your Master Fluid Solutions representative can help you locate vendors of evaporator systems.
- ✓ Filtration can reduce waste water pollutant levels, sometimes to the point where it can be discharged. It takes a very sophisticated ultrafiltration/reverse osmosis system to make wash water clean enough for direct discharge in most situations. So look into this option if your disposal costs are very high.
- ✓ If your company has on-site waste treatment, you may be able to add your spent wash water to the existing process. Usually, the soils you will be washing off come from the manufacturing process, so your waste treatment system is already set up to handle them. Check with the experts in your waste treatment department first.
- ✓ Haul-away costs can vary from less than 25¢ to more than $6 per gallon, depending on where you are and what you are washing into the cleaner bath. Most maintenance cleaner formulas do not require high-cost disposal processes; but if, for example, you wash in traces of heavy metals, the costs can go way up.

Mixing Your Cleaners

Mixing Cleaners

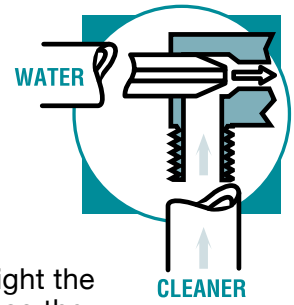
Most maintenance cleaners mix with water without much fuss. There are some that don't mix well, like straight solvents or emulsions, but most do.

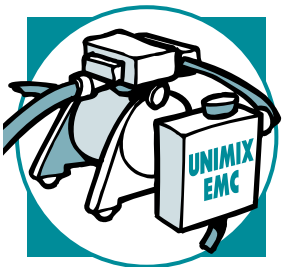
One of the most important rules of cleaner mixing is to **always add the cleaner concentrate to water, not the other way around**. With very caustic cleaners, you could cause some flash-boiling by doing it the wrong way, and that could be hazardous.

Since most high-quality maintenance cleaners can be mixed with water to dilutions as low as 3%, there are several handy tools available to help you mix them to the right concentration easily.

The most popular, low-cost such "tool" is a venturi-style mixer. Our XYBEX Master Mix,™ Skrambler 2,™ and The Whammer™ foam cleaner applicator all mix cleaners with water using the venturi principle. In a venturi mixer, water flows through a nozzle and generates suction that draws the concentrate into the flowing stream of water (see illustration, next page).

A venturi is simple, low-cost, and has no moving parts. On the other hand, concentration can vary with water pressure, flow rate, and even the liquid level in the barrel (the lower the level, the greater the height the cleaner has to be lifted, so the cleaner solution can get more lean). And, if the viscosity of your cleaner is affected by temperature, a cold barrel can give you a leaner solution than if the cleaner were at room temperature. (So, if you store your drums outside in cold weather, it's a good idea to bring them inside for a day or two to warm up before you need to use them.) Don't get us wrong, venturi mixers are still a good choice to mix cleaners accurately for a lot of applications.





A way to get very accurate mixing of cleaners is to use a positive displacement proportioning pump such as the XYBEX UNIMIX.™ Its big advantage is its high accuracy which is unaffected by changes in water pressure, flow rate, or the liquid level in the barrel. On the other hand, a UNIMIX carries a higher price than a venturi mixer, and it does have some moving parts.

Distributed by:

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