

## Filtration Equipment Overview

*Water filtration is a little like crushing rock. You start with the largest piece and filter down to the smallest piece as required for your operation.*

**Primary solids:** From washing processes there are varying amounts of solids (dirt, sand, silt, clay and even gravel) that are produced. These solids must be collected along with the wastewater in a collection system (pit below ground, or Hydropad system above ground). In wash pad systems where heavy solids are present and an adequately sized primary solids settling pit cannot be used a cone bottom tank set above ground can be used to settle out these solids. A pump located in the wastewater collection pit transfers water and solids to the filtration system or above ground tank. Solid settling takes time. The general rule is to allow 45 minutes of retention time in the settling chamber. Regular cleaning of the pit, tank or Hydropad gutters must be done to keep the collected solids from moving into the next point of filtration.  
<http://www.hydroblaster.com/Collect/Hydropads.htm>

**Secondary solids:** These are the free-floating (suspended) solids that do not readily drop out of the water in a settling pit or Hydropad gutter. An active solids separation filter is called for. Hydro Engineering has a unique Continuous Media Automatic Filtration Unit (CMAFU-2) that acts like a cartridge filter but does not require change outs. The CMAFU-2 uses paper media 18" wide and 100 yards in length. In the CMAFU-2 the filter paper is drawn across a conveyor system shaped like a hammock (dipped in the center) causing the wastewater to puddle on the paper. Working like a coffee filter the water drains through leaving the solids on top. As the filter paper becomes plugged with solids the puddle depth increases tripping a float switch that activates the conveyor moving the spent media forward and exposing fresh media to the waste stream. The CMAFU-2 is provided with a 5-micron nominal filter paper, other micron sizes are available upon request. By reducing fine solids early in the filtration process maintenance is reduced on finer filtration methods used later in the system. This means less back flushing of media filters. Paper usage by the CMAFU-2 varies depending on application. The CMAFU-2 is limited to 10-gpm flow, additional units may be required in some applications. **Machine selection: CMAFU-2**  
[http://www.hydroblaster.com/files/model\\_specs/Recycle/CMAFU2.pdf](http://www.hydroblaster.com/files/model_specs/Recycle/CMAFU2.pdf)

**Oils and grease:** If oil or grease is present it must be removed. Most commonly to less than 100 parts per million (PPM). Consult your local sewer department (POTW) for discharge limitations on oils, grease and hydrocarbons. Free-floating oils can be coalesced and then skimmed. Hydro Engineering uses a high concentration laminar flow coalescing system and active oil skimming (belt skimmers). For emulsified oils, media filtration is required. Hydro's approach to hydrocarbon removal depends on several things. Is the customer using high caustic soaps that emulsify the oils? Are they using solvents? If not, coalescing and skimming should be enough. Where heat, chemistry- soaps, solvents or acid are used oils are emulsified and remain suspended in the water column and therefore is then more difficult to remove. Hydro's oil adsorbing media (Hydrosorb™) can reduce hydrocarbons to less than 10 PPM. By making multiple passes through a media filled with Hydrosorb, these emulsified oils can be removed. **Machine selection: HE/S1 or OCS. In existing systems with oil coalescing/skimming present a Polishing Module (SPL24, SPL30) can be added further reducing hydrocarbons to >10 PPM.**  
<http://www.hydroblaster.com/Recycle/HES1.htm>  
<http://www.hydroblaster.com/Recycle/OCS.htm>



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**Organics BOD/COD reduction, Odor control:** Bioreactors are the basic filtration method used by industrial and governmental sewer plants. Any industry producing waste water can benefit immensely from the proper use of the BIOREACTOR. Converting organic matter including oils and greases to harmless water and carbon dioxide and providing pathogen free water are just a few of the benefits. Contained within the reactor is a specific biomass media. The biomass creates a home for trillions of bacteria where contaminants such as organic chemicals, soaps, wax and hydrocarbons are collected for digestion by the bacteria. See the information on Hydro-Biodigesters bacterial products. Machine selection: BR (Bioreactor)

[http://www.hydroblaster.com/files/model\\_specs/Recycle/Bioreactor.pdf](http://www.hydroblaster.com/files/model_specs/Recycle/Bioreactor.pdf)

**Heavy metals and Recirculation systems:** This final step can be skipped if no heavy metals are present in systems where filtered water is discharged to sanitary sewer. Where metals must be addressed we use a secondary polishing system utilizing activated carbon. Metals can have both a physical and chemical attraction to carbon. Many different types of carbon are available and can be targeted to the specific metals found in the wastewater. By making multiple passes through the filter media (polishing) we obtain very good metals reduction rates. **Machine selection: HE/3000, HE/5000, ACF3, HE/7000, HE/8000 & DPL30.**

[http://www.hydroblaster.com/files/model\\_specs/Recycle/HE3000.pdf](http://www.hydroblaster.com/files/model_specs/Recycle/HE3000.pdf)

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