



A Technology to Re-cycle and Re-Use Alkaline Cleaners

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What is an Alkaline Cleaner?

- ▶ High pH, commonly 10 to 12 range
- ▶ Used to clean oils, grease, and other surface contaminants from the surface of metals or plastics
- ▶ Prepares the surface for the next process (i.e. plating, painting, etc.)
- ▶ Formulated to include a water conditioner, surfactant, surfactant “package”, and sometimes a rust inhibitor
- ▶ Normally this is dumped after it becomes too loaded with contaminants to function properly

Why Re-cycle the cleaners for Re-use?

- ▶ Reduce water usage, reducing water bills, sewer users costs
- ▶ Reduce the purchasing of chemicals, also helps to reduce transportation costs
- ▶ Reduces the associated cost of wastewater disposal and/or treatment
- ▶ Reduces the associated labor costs which are a result of dumping cleaner baths.
- ▶ May show a reduction in energy consumption by returning hot cleaners back to the process without prior heating
- ▶ Allows for a competitive edge in reducing the bottom line in manufacturing costs.

How it Works

- ▶ 0.1 micron titanium alloy membrane selectivity segregates the smaller water soluble molecules from the large emulsified bodies.
- ▶ Allow the smaller water based molecules to pass through, but retains the larger soil aggregations
- ▶ The process concentrates the solution to a point where permeate production falls off and it is time to clean the containment tank.
- ▶ The hotter the solution, the better, up to 180 F
- ▶ The permeate can either be returned to the cleaner tank directly or used as a rinse, or if acceptable, sent to drain.

Monitoring the Process

- ▶ Most alkaline cleaners are titrated on line in order to determine the alkalinity present.
- ▶ As the cleaner becomes exhausted, the alkalinity will decrease.
- ▶ Additions of fresh cleaner are necessary to bring up the alkalinity to the desired value
- ▶ After a while the cleaner can no longer be revived and the tank must be dumped and re-charged.
- ▶ Two categories of alkalinity: Free and Total.
- ▶ Free Alkalinity is measured by added the indicator (phenolphthalein) and titrating with a weak sulfuric acid until you achieve a clear endpoint.
- ▶ Free alkalinity is a measure of the available cleaner to do the job

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- ▶ Total Alkalinity the measure of all the alkalinity present both available for work and and what is available to maintain the strength of the pH
- ▶ To determine Total Alkalinity you use bromo green and titrate to a pink end point.
- ▶ The ratio of free to total is a measure of how much new cleaner to add.

Demo of Cleaner Re-cycling and Alkalinity Testing

- ▶ Dirty parts washer soap solution
- ▶ Has surfactants, oils, metals, and soils present
- ▶ An on-line titration has indicated that it is time to dump soap bath for waste hauler to pick up



Thank You!

Any Questions????