



**Western Cape
Government**

Environmental Affairs &
Development Planning

BETTER TOGETHER.

Counter Current Rising

COUNTER-CURRENT RINSING

FACT SHEET

Rinsing is an everyday function for many business operations in the industrial sector. These rinsing operations often take place using traditional methods that use more rinse water than necessary, which results in high water bills and wastewater treatment costs.

Industrial facilities make use of one of two rinsing systems namely; single flow or counter-current rinsing. A single flow rinsing system may consist of one or more rinse tanks but each tank is completely separate. Contaminated products are immersed completely in fresh water and this is then drained. This rinsing method consumes large volumes of water for rinsing. However in counter current rinsing systems water circulates through a series of connected rinse tanks, flowing in the opposite direction of the workflow. Fresh water enters the last rinse tank, overflows to the next rinse tank and continues until it exits via the first rinse tank. This method allows the work piece to be rinsed in the least pure water first and the cleanest water last. And most importantly, it reduces the amount of clean water required. Practical experience and studies have proven that slightly contaminated overflow from the subsequent rinse is just as effective as clean water, making it a very efficient rinsing system.

WHY implement?

A counter current rinsing system uses much less water than a single flow rinsing system. Implementing a counter current rinsing system renders various benefits to a facility such as:

- Counter current rinse system may reduce typical water consumption by 40-50%. In an electroplating industry a two-stage counter current rinse system may reduce typical water consumption by 90-97%, while a three-tank counter current rinsing system reduces water use by 95-99%.
- Reduction in sewage disposal that leads to reduction in sewage costs.

HOW to implement?

Counter current rinsing tanks can be purchased new or retrofitted into an existing tank. Retrofitting existing tanks can be done by dividing large existing tanks into a series of compartments.

A tank, plumbing and a level switch and pumps are the essential equipment needed to put counter current system in place.

Example

A plating company using a counter current nickel bath with the initial bath solution containing 270 000mg/l total dissolved solids and final rinse bath solution no more than 40mg/l- dissolved solids. A single rinse tank used 25 kl of fresh feed water for each 3.8liters of plating solution dragged into the rinse tank. A two-stage counter current rinse tank used 0.31 kl of fresh feed water. Therefore using a two stage counter current rinsing system would render 98 % savings in water.

- Using spray nozzles as part of a rinse system can significantly reduce drag-out of expensive and hazardous process chemicals and the amount of rinse water needed. For more information visit the [Pfonline](#) web page.
- Drag out, which is the bath solution that is carried out of the process bath and into succeeding tanks, is the primary source of contamination in rinse water. For information visit the [NEWMOA manual](#) and see **Drag out Reduction** subheading.

Sources and Useful Links:

- Environmental Protection Agency : <http://es.epa.gov/techinfo/facts/nc/tips10.html>;
<http://es.epa.gov/techinfo/facts/nc/tips11.html>
- Envirowise : www.envirowise.gov.za
- NEWMOA Manual (Northeast Waste Management Officials Association):
http://www.wmrc.uiuc.edu/main_sections/info_services/library_docs/manuals/finishing/rinsing.htm
- Pollution Prevention in Rinsing:
http://www.wmrc.uiuc.edu/main_sections/info_services/library_docs/manuals/finishing/rinsing.htm
- Pfonline: <http://www.pfonline.com/articles/030005.html>

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The entire range of fact sheets can be found by visiting the www.capegateway.gov.za web page.