Guest Editorial

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Rinsewater Economy

"The time to minimize rinsewater consumption is at the beginning of the system design."

The intelligent and economic use of rinsewater is vital to the surface finishing industry.

Why, then, does our industry, which depends so heavily on rinsewater "smarts," and which claims to understand the water-minimizing power of countercurrent rinse hydraulics, find this concept so difficult to apply?

As a general rule, multi-tank rinse systems almost always have too few rinse stages and the hydraulics are frequently not ideal. Companies using multi-tank rinses often claim them to be "countercurrent" systems. Close scrutiny, however, often proves otherwise. To truly minimize the use of water, and better support the use of waste minimization methods, true countercurrent rinse hydraulics are essential.

The phrases "counter-flow, cascade, and counter-current flow" are used interchangeably when referring to rinse system hydraulics. This semantic sloppiness creates confusion.

The description "counter-flow rinses" isn't definitive. It conveys no useful information about the tank arrangement or hydraulic effectiveness.

The phrase "cascade rinses" is somewhat more descriptive. Cascade rinse systems are common. Compared to multiple, open-flow rinses, cascade hydraulics can reduce water usage, but stage-by-stage effectiveness and efficiency are difficult to quantify or model.

In comparison, "counter-current (CC) rinse" hydraulics are definitive and conveniently quantifiable. It can be shown mathematically that true CC hydraulics reduce rinsewater requirements exponentially as a function of the number of rinse stages available. The more stages, the better—the use of spray rinsing, pump forward techniques, air knives, etc., notwithstanding.

If floor space is tight, consider converting drag-out (DO) tanks, or still tanks, to running CC rinse stations. Running rinses are more powerful than DO tanks in terms of reducing water requirements for a given level of rinsing. Drag-out and still tanks require space and become extensions of the plating bath in which no plating is being done.

Adding rinse stations to operating plating machines is almost impossible. Space constraints and competitive pressures too often require the suppliers of plating machines to skimp on the number of rinse stages following a bath. Even then, hydraulic flow patterns may not be ideal. So, even if we know better, we are stuck!

Our industry still consumes more water than it should. The time to minimize rinsewater consumption is at the beginning of the system design. We can do better. P&SF