



## MILESTONE duoPUR & subCLEAN

### Frequently Asked Questions

#### Q 1: Which acids can I distill with this system?

Answer: The duoPUR can be used to purify all common laboratory acids, mainly HNO<sub>3</sub> and HCl. HF purification can be done in the subCLEAN, which use a PTFE boiler. The use of H<sub>2</sub>SO<sub>4</sub> and H<sub>3</sub>PO<sub>4</sub> is not recommended due to the high boiling point.

#### Q 2: I currently purchase Baker ULTREX® II or SEASTAR Optima Grade acids. Can I distill my own acids with the duoPUR and get them as clean as these?

A: Yes. Acids produced with the duoPUR are as clean as, or cleaner than, commercially available double-distilled acids.

#### Q 3: How long will it take to distill my acid, and how much can I distill at one time?

A: The time and power settings for the subPUR, duoPUR, subCLEAN system determine the distillation rate and the purity of the distillate. Higher power results in faster distillation rates, but the purity may suffer. Simple method development will determine the proper program time for your required acid purity. See the chart below for typical production rates.

| subPUR APPROXIMATE PRODUCTIVITY RATE (mL / h) for each still |                  |                  |     |
|--|------------------|------------------|-----|
| POWER  | H <sub>2</sub> O | HNO <sub>3</sub> | HCl |
| 20 %   | 15               | 15               | 10  |
| 30 %   | 40               | 35               | 40  |
| 50 %   | 70               | 55               | 70  |
| 60 %   | 90               | 80               | 90  |

| subCLEAN APPROXIMATE PRODUCTIVITY RATE (mL / h) |                  |                  |     |
|---|------------------|------------------|-----|
| POWER   | H <sub>2</sub> O | HNO <sub>3</sub> | HCl |
| Low temp  | 20               | 20               | 20  |
| High temp                                       | 80               | 65               | 65  |

\* The above rates are intended to provide guidelines on the purification rates which could be affected by several parameters

#### Q 4: If I want to double-distill my acid, should I run it twice in the same still, or sequentially using one still and then the second?

A: The easiest method sequentially in one still then in the second. However, if the duoPUR is used to purify more than one acid type, using the same still twice is better option, because it will limit the draining and rinsing time. Also, the impurities leached from the quartz are not the same from acid to acid. This might result in elevated concentrations for some elements or recontamination of the quartz. Repeated distillations using the same acid results in a “cleaning effect” on the quartz, effectively making it cleaner each time the system is run.





#### | Q 5: Can the system become contaminated?

A: The duoPUR is a closed system that cannot become contaminated during proper, routine use. It is possible, however, for an operator to introduce contaminants into the system. The most common source of contamination is the collection bottle. Milestone recommends the collection bottle only be used to collect the purified acid, and not for routine dispensing.

#### | Q 6: How often does the system have to be drained?

A: The system should be drained every six months, or when the quality of acid begins to degrade.

#### | Q 7: How do I drain (get rid of) the waste acid?

A: The dedicated pump allows to drain and fill the system automatically, further reducing the user exposure to the acid.

#### | Q 8: Can the duoPUR be run unattended, or does someone need to be present while it runs?

A: The microprocessor control and the safety interlocks allow the system to run unattended.

#### | Q 9: Can I purchase a subPUR system now and upgrade with a second still later?

A: Yes, an upgrade kit is available.

#### | Q 10: Why would I want to make my own high-purity acids when I can just buy them?

A: Making your own acids is much less expensive than purchasing them from an outside supplier. Depending on your individual rate of use, it may take just a few months for a sub-boiling distillation unit to pay for itself. See our duoPUR savings calculator to analyze your individual situation. Also, you will have the added advantages of being able to re-purify your contaminated acids, rather than downgrading them and allow for acid purification on-demand.

#### | Q 11: You have several different products in your Clean Chemistry line: acid purification, trace cleaning system, closed-vessel digestion and evaporation. What do they all have in common?

A: All of the products in our Clean Chemistry line are designed to help you control your analytical blank, the “Achilles heel” of trace analysis, and to improve your detection limit. Reagent purity, cleanliness of the materials used in sample preparation, the laboratory environment, and the skill of the analyst are all factors that contribute contamination. Each of those factors can be minimized with our technology.