



CHROMATOGRAPHIC SPECIALTIES INC.

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Worried about acetonitrile rationing? - 3 simple ways to reduce solvent consumption

1. Move to smaller ID columns.

- New flow rate is proportional to the square of the internal diameter of the new column over the old column $(ID_2 / ID_1)^2$
- Run time is unchanged. Solvent use saving is in proportion to flow rate change.
 - 4.6mm ID -> 4.0mm = 76%, 24% saving in solvent use.
 - 4.6mm ID -> 3.0mm = 43%, 57% saving in solvent use. *
 - 4.0mm ID -> 3.0mm = 56%, 44% saving in solvent use.
 - 3.0mm ID -> 2.1mm = 49%, 51% saving in solvent use. *

* These are outside the standard USP <621> method adjustment guidelines for not having to revalidate. Pharmaceutical companies will wish to consult with Health Canada, the FDA or other regulatory bodies as appropriate to their products' final markets.

2. Reduce particle size and column length in proportion.

- Resolution is maintained
- Run time reduction is proportional to the decrease in column length.
- Flow rates remain unchanged.
- Solvent consumption is reduced in proportion to run time.
- Gradient times need to be modified in proportion to column length.
 - 10um column replaced by 5um column, solvent consumption reduced by 50%
 - 5um column replaced by 3um column, solvent consumption reduced by 40%
 - 3um column replaced by 1.8um column, solvent consumption reduced by 40%

3: Move to a shorter and narrower column

- Solvent savings = $100\% - \left(\left(\frac{ID_2}{ID_1} \right)^2 \times \frac{L2}{L1} \right)$
 - 4.6 x 250mm 5um column -> 3.0 x 150mm 3um column = $100\% - (43\% * 60\%) = 72\%$ savings in solvent use!

Most of CSI's HPLC columns are available in multiple particle sizes, allowing you to change particle size without changing bonded chemistry.

For gradient methods, you may need to accommodate the delay between a change in mixing at the pump and the change in mobile phase reaching the head of your column. Typically this is accomplished by delaying your injection for a short period after starting the gradient program on your HPLC pump.

For more information on how to run more samples with less acetonitrile, call our thrifty Technical Support team at **1-800-267-8103** or email tech@chromspec.com

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