Question: In one of your AppNotes, it may appear that the 4um column produces a narrower peak width than the 2.o column. Does this mean it is more efficient than the 2.2um column?

Answer: Efficiency is a function of two variables: peak width and retention time. Hence, a compound may have a higher efficiency on one column if its retention time is high enough, even though its peak width appears to be wider. But efficiency is not the most common way to determine efficiency in a method using gradients. But if you still want to use efficiency as a benchmark and calculate efficiency, you can use the following equations:

$$N = 16 \, (tR/w)^2$$
$$Plates/meter = N/L$$

where N is plate count, tR is retention time in min, w is peak width in min, and L is column length in meters. In the case of this application note, the following values were obtained:

Particle Size	Peak Width (min)	Retention Time (min)	Column Length (m)	Plates	Plates/m
2.2um	0.2064	6.313	0.05	14968	299366
4.4um	0.2021	5.721	0.05	12821	256426

Hence, the 2.2um column has the higher "efficiency" even though the peak width appears to be wider. The data and calculations can also be downloaded as an Excel file.

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