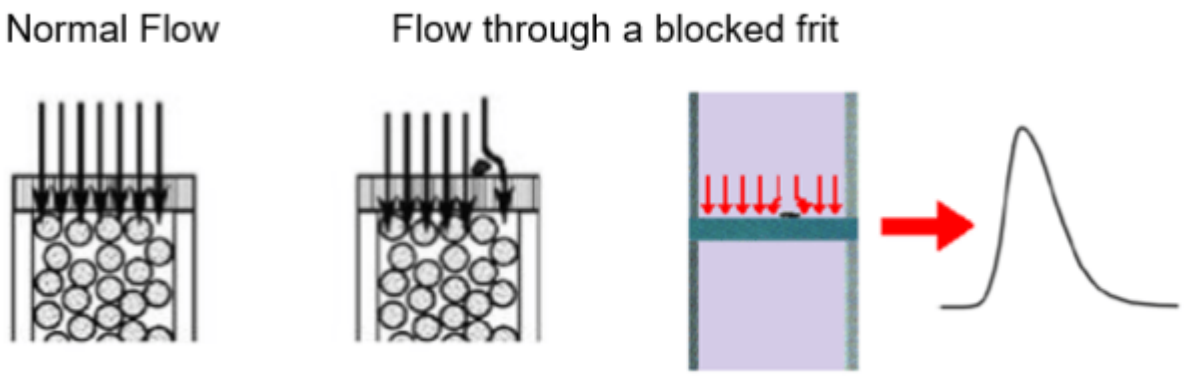
Guest Author – Dr. Helen Whitby, Technical Specialist

Letting go of your favorite column can be hard to do, so when is it really time to say goodbye? Below are some of the signs to look for that your relationship and your HPLC column lifetime is coming to an end.

- High Backpressure not reduced by reverse flushing the column
- Split Peaks
- Loss of resolution
- Broad peak shape
- Retention time shifts

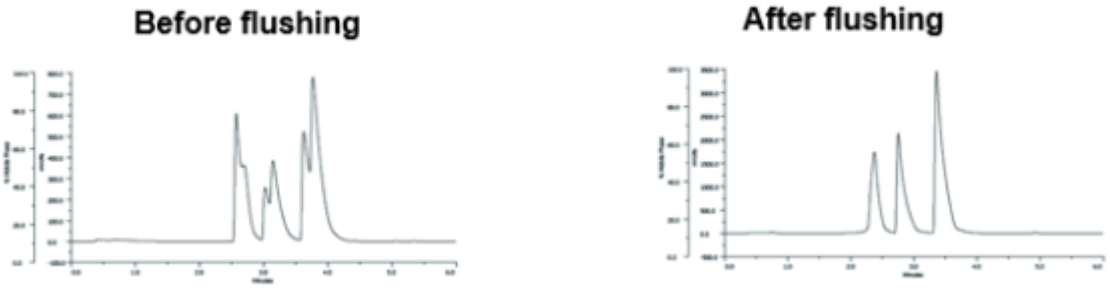
High Backpressure:

Increases in backpressure are typically the result of a blockage at the inlet frit of the HPLC column. To remove the blockage in most situations you can reverse the flow of the solvent through the column at a reduced flow rate and flow 100% strong solvent through the column to remove this. If your pressure does not return to normal either the frit is blocked irreversibly or there is a void in your column. Both of situations require the column to be replaced.



Split Peaks:

Many split peaks are also the result of a blocked frit at the inlet of the column which results in a channeled injection. To resolve this follow the steps outlined above first and foremost. If the split peak remains the likely cause is either incorrect running conditions of your method (working too close to the pKa of your compound or using a strong injection solvent) or your column may be fouled with strongly retained contaminants. If the inlet is irreversibly plugged or the stationary phase fouled with contaminants you will need to replace column.

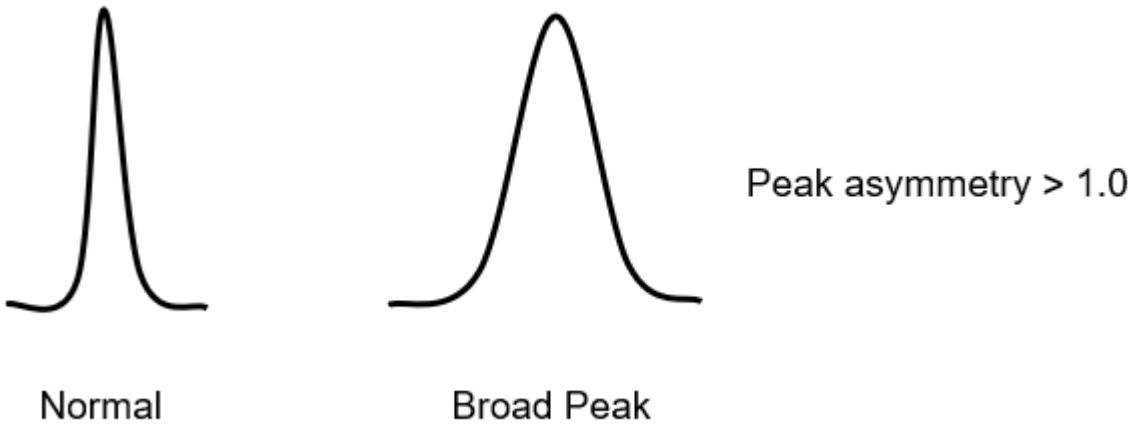


Loss of Resolution:

HPLC columns are consumable items and as such over time you will begin to lose resolution of your critical pairs. Some column regeneration may be possible and each column will have its own individual protocol for this, however once loss of resolution of a critical pair of compounds has been reached and cannot be regenerated, your column has reached the end of it's natural life for the particular analysis you are doing.

Broad Peak Shape:

Some peak broadening can occur for reasons other than the natural end of the life of a column, these include: injection overload, inadequate buffering, inappropriate method conditions, and strong injection solvents. However, if these elements have been eliminated, peak broadening is one sign your column is ageing. Once your peak shape has deteriorated to the point you can no longer pass system suitability or resolve critical pairs it is time to part ways.



Retention Time Shifts:

More often than not retention time shifts are the result of poor method control, however in the case of phase contamination you will see retention time drifts of peaks if your phase is becoming fouled. Not all peaks will be affected equally and if you have eliminated all method concerns from your troubleshooting the likely cause is stationary phase contamination and your column will need to go.

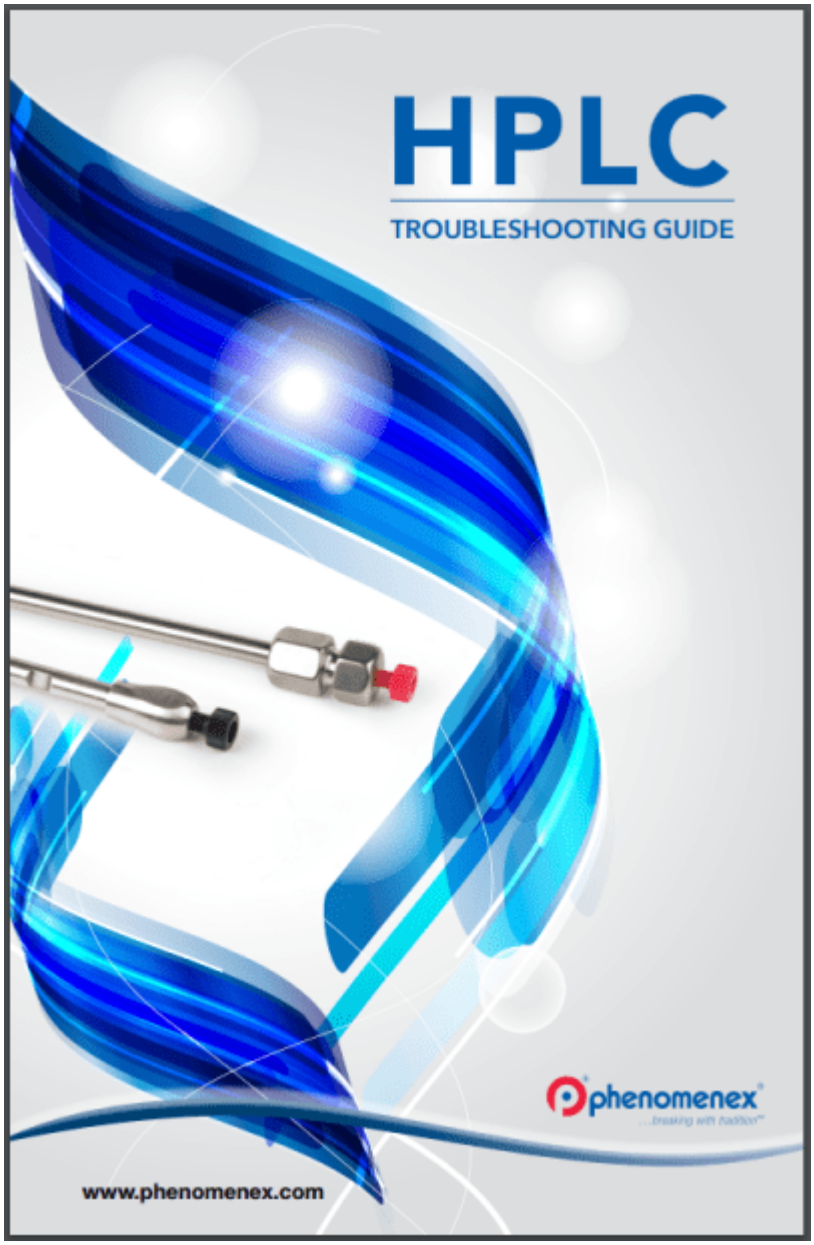
To be certain the column is the problem there are a few things you can test

- Clean the column either by a reverse flush or other method outlined in the specific column care guide; each column has an individual guide but a general one for most columns can be found here.
- Test the column using the appropriate test mix the column was QC'd in. This

will tell you how the selectivity has changed since you began use.

- Check the date you received the column. Chances are if it has been in your lab since 2008 it's time to upgrade to a newer model.

All of these troubleshooting points are discussed further in our HPLC troubleshooting guide which can be downloaded by clicking here.



If you have any questions regarding your HPLC Column Lifetime, or need other technical assistance, you can reach out to our technical specialists, like Helen, through Chat Now. It

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