

UNDER THE HALO® : Guard Columns

UHPLC and HPLC guard columns are a great way to increase your column's lifetime while preserving column efficiency. The reason why they are called guard columns is because they help protect or "guard" the analytical/prep column from particulates. These particulates can lead to contamination along with column plugging (which will increase the back pressure). Not only can particulates damage the column and decrease their lifetime; they could also damage the HPLC system as well.

There are several different types of particulates that a guard column can help prevent from entering the analytical column. The main source of these particulates is from the mobile phases, for example, a common particulate is dust, which gets into the mobile phase and eventually enters the HPLC system. A simple and efficient way to prevent this from happening is to make sure you are filtering your mobile phases with at least a 0.22/0.45 µm filter, then sonicate, and degas the mobile phase afterwards.

Another common particulate can come from the sample itself. It is important to take sample preparation seriously and make sure that the sample is as "clean" as possible. A sample matrix such as plasma or urine will have a bigger impact on the column than a neat standard. In either case, it is recommended to filter your samples before injecting them. Particulates can also come from the HPLC system, for example, damaged pump seals could cause issues with blockage. Also, the needle could pick up particulates from a worn-down seal or sample vial. It is important to have a scheduled preventative maintenance in place to avoid these issues. If the analytical/prep column does get plugged by a particulate, you could try backflushing the column with 100% organic mobile phase.

HALO® guard columns are simple to install and even easier to use. The finger-tight guard cartridge holder is loaded with a guard cartridge. These guard cartridges come in all bonded phases that HALO® has to offer along with 2.1, 3.0-, and 4.6-mm IDs. Make sure that the bonded phase from the analytical column is the same bonded phase as the guard cartridge. After the cartridge is placed in the holder, the guard column is placed on the inlet side of the column. Figure 1 shows an illustration of the guard column.

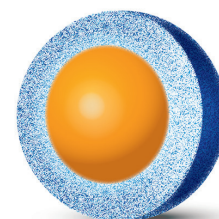
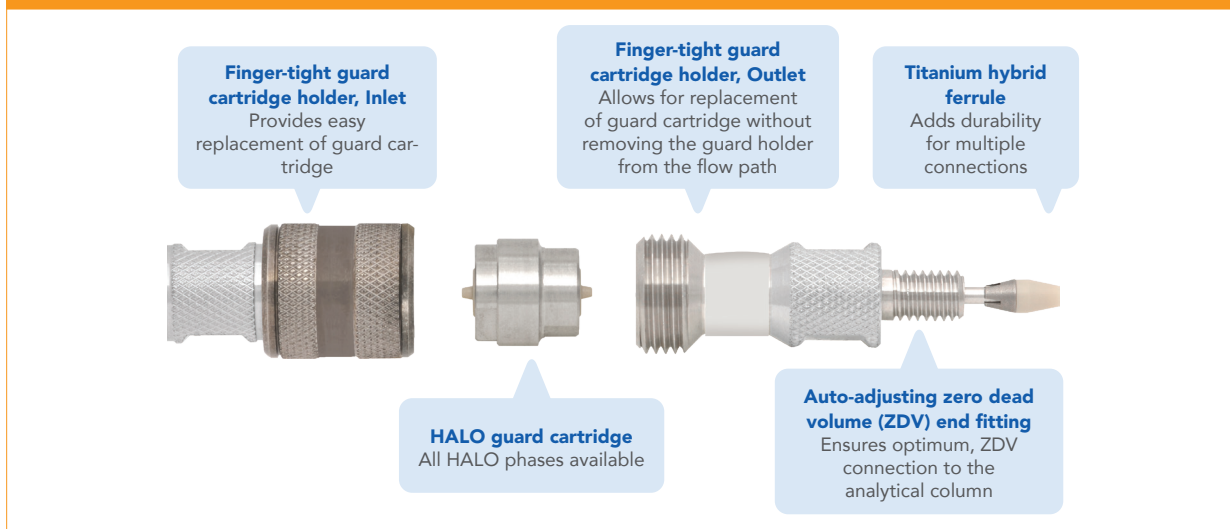
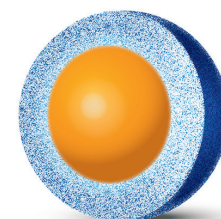
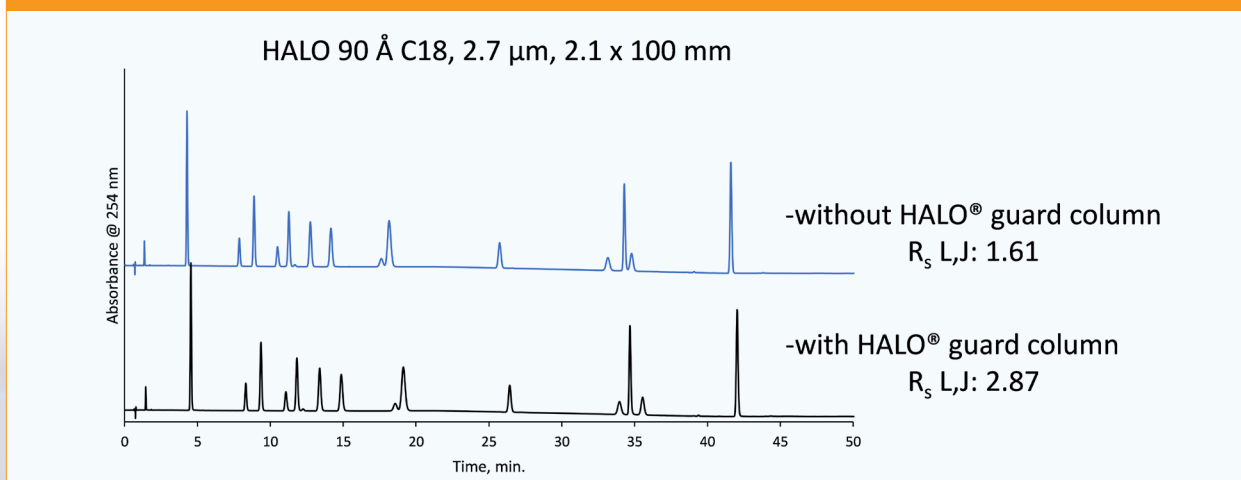


FIGURE 1: HALO® GUARD COLUMN ILLUSTRATION/ASSEMBLY



There are only minor differences when comparing a column with a guard column to one without. For example, Figure 2 shows a separation of paracetamol along with fourteen of its impurities using the EP method. By having a guard column in place, retention times and back pressures are going to slightly increase, as they may be considered a minor added length of the column. Hence, efficiency and resolution will remain comparable. In fact, in this example, resolution between critical pairs increases when using the guard column.

FIGURE 2: A SEPARATION OF PARACETAMOL AND FOURTEEN OF ITS IMPURITIES WITH AND WITHOUT THE USE OF A GUARD COLUMN.



CONCLUSION

All chromatographers should consider using guard columns in order to increase the column's lifetime. Whether you are working in an analytical, clinical, production, or R&D lab setting, guard columns help you save money and time troubleshooting. Guard columns are proven to help prevent particulates from entering the column and have shown similar results to columns without using one. Replacing a plugged guard column is easier than replacing a plugged analytical column. Incorporation of the use of a guard column allows an easy change that does not require extra method development.

To find a HALO® Guard part number, please use the searchable database on the website:

Please select "guard" in the Format field

<https://www.advanced-materials-tech.com/find-a-part-number/find-a-part-number-results/>

