

A μ BONDAPAK™ C₁₈ COLUMN:

OTHER CONSIDERATIONS

A previous Lab Highlight (LAH #0147) described how to operate the μ BONDAPAK™ C₁₈ column to obtain optimum performance ($\leq 14,000$ plates for the test chromatogram). However, there are other features of this column.

Selectivity. The μ BONDAPAK™ C₁₈ column is widely recognized as having a versatile selectivity so as to be the most widely used and published packing in the world. Unfortunately, the efficiency of this column is often misquoted and misinterpreted.

Demanding Test for Efficiency. Waters measures the plate count using the Five-Sigma Method. The most popular method is the Half-Peak-Height measurement which does not account for tailing. In using the Five-Sigma Method, a peak width measurement is made at 4.4% of the total peak height, permitting sensitive detection of poor column performance due to peak asymmetry. If a column supplier only uses the Half-Height Method for efficiency, they cannot guarantee the uniformly packed columns that Waters does.

Dilution in the Column. Waters™ μ BONDAPAK™ steel columns are 3.9 mm ID while most other manufacturers' columns with 10 μ particles are 4.6 mm in diameter. Since dilution in the column is dependent upon the square of the diameter, Waters™ columns are significantly better in that they have 40% less dilution so that there is 40% more sensitivity over a column of equivalent length.

Extra-Strong Column Wall. Only Waters™ columns contain a patented dual stainless steel tubular wall to ensure high strength which results in a consistently-packed bed structure. The Waters™ "column within a column" provides maximum resistance to wall expansion - "ballooning" - under high back pressure. Furthermore, all Waters™ columns are prestressed prior to packing for added resistance to elastic deformation.

Easy Column Maintenance. Waters™ patented zero dead volume end fittings provide high efficiency coupling to ensure maximum performance in the system. The compression screw design and welded end fittings eliminate the inconvenience of changing worn end fittings. Waters was the first to introduce this design. A few have attempted to copy it, but none have surpassed it.