

Pressure Flow Characteristics of YMC's BioPro IEX SmartSep

The pressure flow characteristics of a resin determine its productivity and are therefore one of the key factors in developing an efficient purification process. Flow and generated backpressure are directly dependent on each other. But the properties of the resin also have a great influence on the generated pressure drop. A high-quality resin such as YMC's BioPro IEX SmartSep S30 enables comparable low back pressure, so that the flow rate can be correspondingly higher.

This leads directly to shorter retention times and, consequently, to significant time savings.

This Technical Note compares the pressure flow characteristics of the commonly used ion exchange resins BioPro IEX SmartSep S30 and Source 30S from Cytiva. YMC's BioPro IEX SmartSep is based on polymethacrylate beads whereas the alternative is based on polystyrene/divinylbenzene beads.

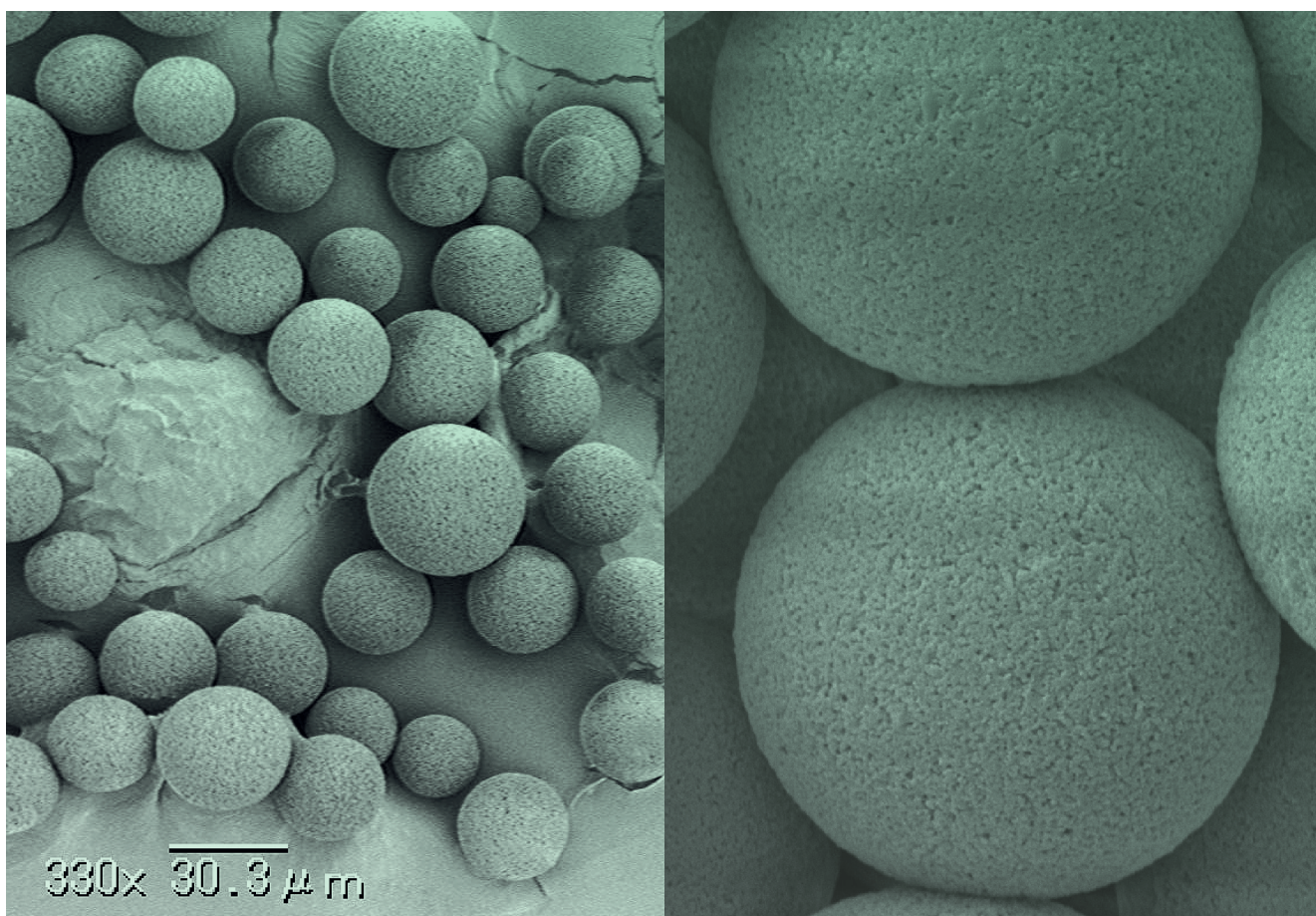


Fig. 1: Microscopic images of BioPro IEX SmartSep S30 particles

Comparison Study

A 30% slurry in 20% EtOH with 0.2 M NaOAc was poured into a YMC ECO^{PLUS} column (15 mm ID). The resin was consolidated with a linear flow velocity of 72 cm/h. The consolidated bed height was 10 cm in both cases. The flow was increased stepwise and the stabilised pressure at each increment was noted.

Results

The resulting pressure flow curves are shown in Figure 2.

Across the entire flow rate range, the BioPro IEX SmartSep resin provides a lower backpressure which allows for higher applicable flow rates. In addition, the pressure flow curve of BioPro IEX SmartSep S30 suggests reversible compression behaviour over a wide range of linear flow velocities.

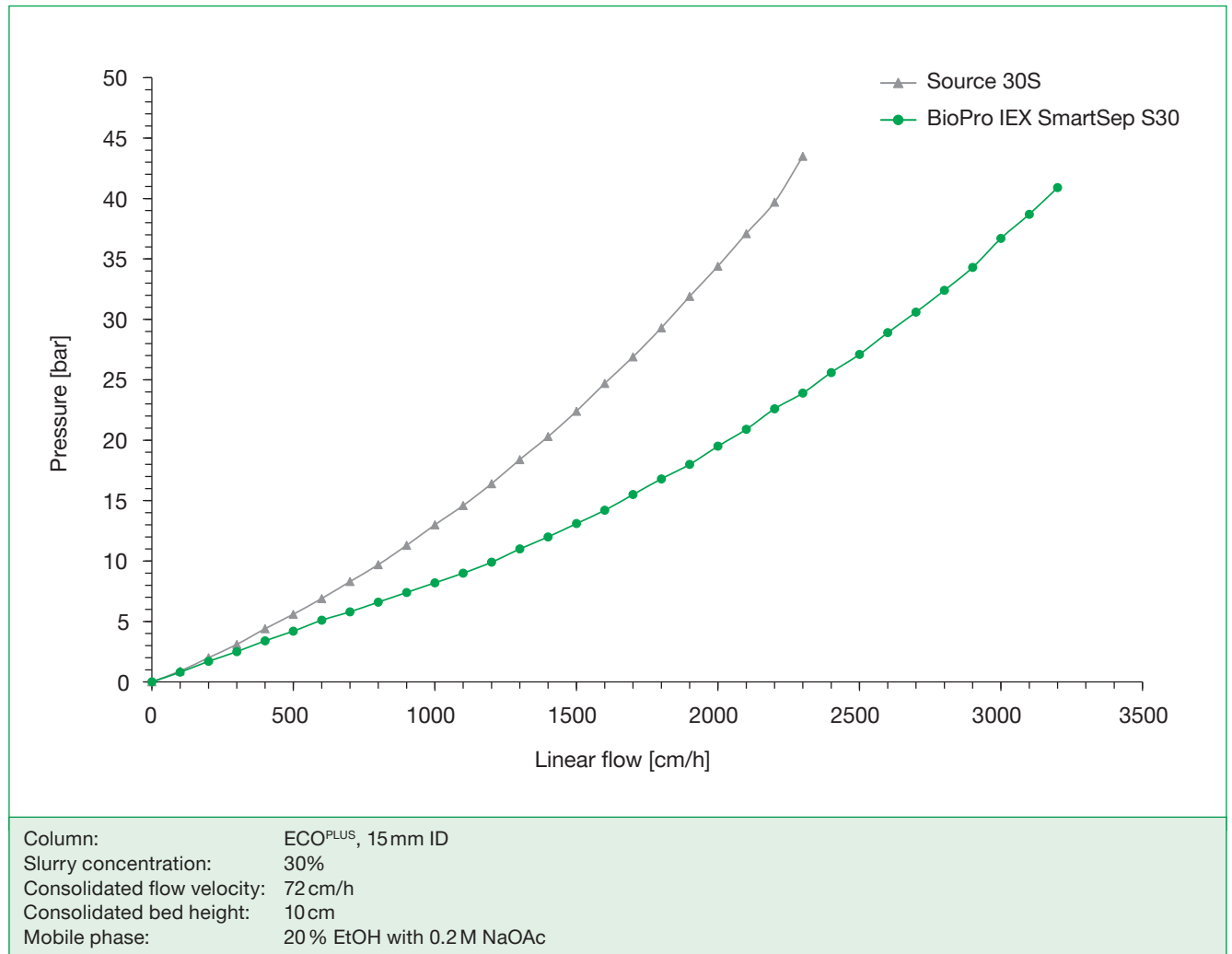


Fig. 2: Pressure flow curves for BioPro IEX SmartSep S30 and Cytiva Source 30S

Conclusion

YMC's BioPro IEX SmartSep S30 shows significantly better pressure flow characteristics. This may be related to the rigidity of the beads used since pressure flow characteristics are mainly based on the physical properties of the base particles.

This allows the BioPro IEX SmartSep resin to be used over a greater range of flow rate and at higher flow rates, increasing productivity. For a pressure range of up to 20 bar (regular use), the YMC resin can be used with flow rates of up to 2,000 cm/h (max. flow rate) for a bed length of 10 cm.