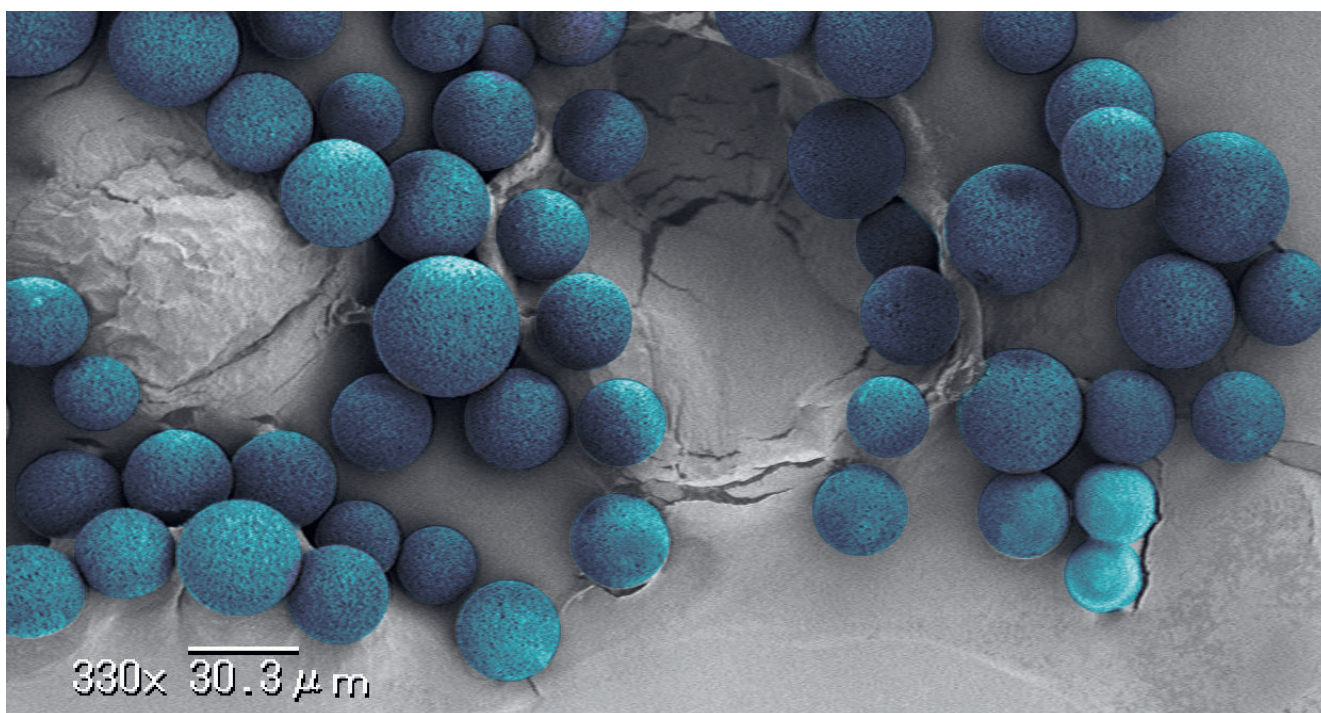


## How resin packing properties determine excellent chromatographic performance

### Abstract

Modern chromatographic packing materials for process scale are characterised by high separation efficiency and therefore by increased productivity. This high performance is directly linked to the physicochemical properties of the resin and therefore its packing characteristics. Stable and uniform particles that can be packed in an

efficient and reproducible manner generate good chromatographic results. Therefore, modern resins with good packing characteristics are the first choice for productive downstream processing. In this technical note, the packing characteristics and the resulting performance of the strong cation exchange resinBioPro IEX SmartSep S30 is investigated.



BioPro IEX SmartSep S30 particles

## Packing study with BioPro IEX SmartSep S30

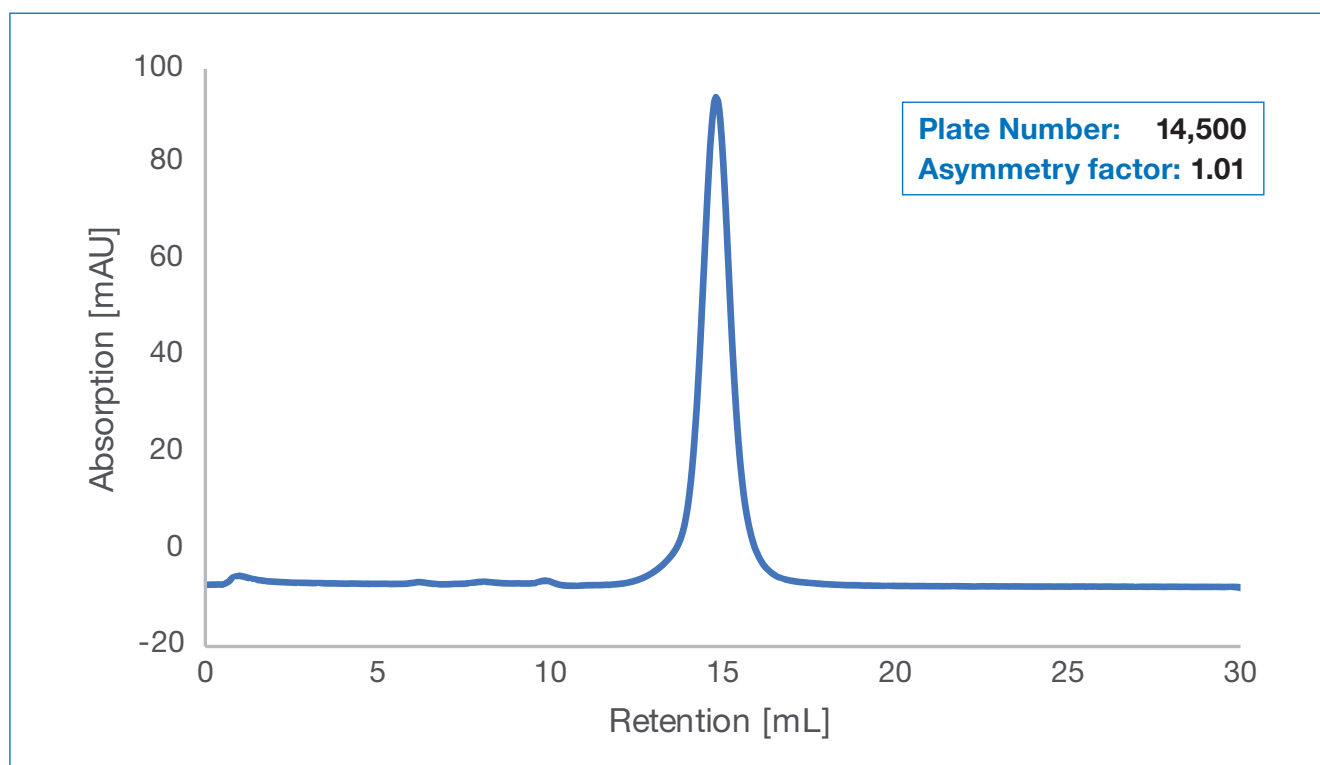
To investigate the packing characteristics of the BioPro IEX resins from YMC, the material was packed several times into a laboratory glass column with 15 mm ID using the following procedure:

- The fines were removed and the resin was washed with 100% water
- A 30% slurry in 100% water was transferred into a YMC ECO glass column
- The resin was consolidated under a linear flow with 100% water
- Finally, the resin was compressed to a final bed height of 10 cm
- The column performance was qualified as described in the care and use instructions
- The column was unpacked and the procedure was repeated using the same material

This packing procedure was repeated multiple times and the qualification results were monitored.

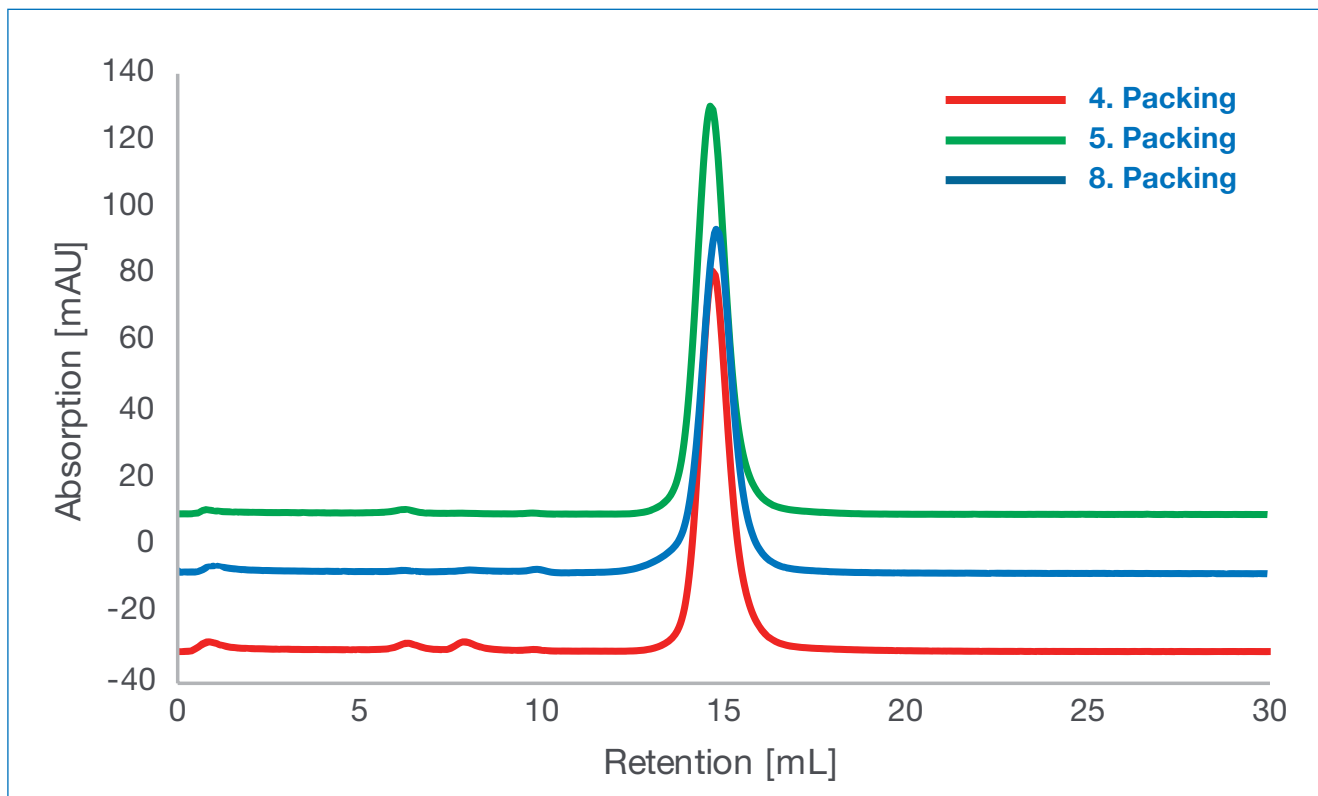
## Results: good and reproducible chromatographic performance

Based on the packing properties of the BioPro IEX resin, excellent packing results are achieved. The chromatogram below shows a typical column qualification result after the packing process: high plate counts and symmetric peak shape indicate the excellent chromatographic performance.



Column:	ECO glass column, AB version, 15mm ID, max. bed length 200mm
Resin:	BioPro IEX SmartSep S30, 30µm particle size
Consolidation flow velocity:	72 cm/h
Consolidated bed height:	10 cm
Mobile phase:	20 mM sodium phosphate buffer pH 7.0
Sample:	100µL formamide (2µL/mL dissolved in water)
Detection (UV):	220 nm

Multiple packing cycles are possible with continuously reproducible excellent packing results. The following chromatogram shows three independent column qualifications: after 4 packings, 5 packings and after 8 packings – the performance of the resin remains at a high level.



Column:	ECO glass column, AB version, 15 mm ID, max. bed length 200 mm
Resin:	BioPro IEX SmartSep S30, 30 $\mu$ m particle size
Consolidation flow velocity:	72 cm/h
Consolidated bed height:	10 cm
Mobile phase:	20 mM sodium phosphate buffer pH 7.0
Sample:	100 $\mu$ L formamide (2 $\mu$ L/mL dissolved in water)
Detection (UV):	220 nm

## The resin properties determine the packing results

Uniform particles based on a highly stable material allow the formation of a homogeneously packed bed that enables an efficient separation. This is the basis for highly productive downstream processes. Resins that are composed of hydrophilic polymer materials can be packed very easily with 100% aqueous conditions – this makes every packing process much easier and saves costs and resources. In addition, high slurry concentrations are possible if necessary.

Therefore, modern process scale resins are based on hydrophilic polymer beads with high stability and good packing characteristics.

The uniform and hydrophilic particles of the **BioPro IEX** resins provide excellent mechanical stability. This leads to continuously good packing results and allows multiple repacking. The particles form uniform resin beds for efficient DSPs.



### Detailed packing guidelines and support available

Packing of soft gels into chromatography columns requires experience and knowledge. Every resin has its own packing behaviour and requirements. For BioPro IEX, detailed documentation and packing guidelines are available – providing all the information and support for efficient packing of the resin.

- **Step-by-step guidelines for packing of glass columns**
- **Detailed packing instructions for BioPro IEX**
- **Resin care and use instructions – including preparation, qualification and storage procedures**
- **Packing studies providing insights into packing factor optimisation**
- **Technical support and packing service available**

### Conclusion

**Good resin properties and packing characteristics are the key to efficient chromatographic performance and high productivity of the downstream process. BioPro IEX resins are composed of robust hydrophilic polymethacrylate beads with excellent packing properties!**

**High mechanical stability, together with the ability to use aqueous packing solvents and high slurry concentrations leads to continuously high packing results and therefore excellent chromatographic performance, even after multiple repacking. Additionally, there are detailed packing guidelines and technical support available.**