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## TOYOPEARL GigaCap<sup>®</sup> S-650M

The newly developed Toyopearl GigaCap S-650M is a high capacity resin for Ion Exchange Chromatography especially designed for:

- ◆ High throughput process chromatography
- ◆ High binding capacities for a wide range of bio-molecules

Toyopearl is a methacrylic polymer incorporating high mechanical stability. Resins are available as non functionalized resins for SEC or derivatised with surface chemistries for alternative modes of chromatography such as IEC, HIC and AFC.

### Toyopearl GigaCap S-650M highlights

- ◆ Strong cation exchange resin
- ◆ Excellent pressure flow characteristics
- ◆ Dynamic binding capacities of up to 150 g/L for both IgG and Insulin

### Ion exchange chromatography in downstream processing

Ion exchange chromatography is often used as capture or intermediate step in purification of recombinant proteins. The development of cell lines with high expression levels has triggered the demand for high throughput in downstream processing. Increasing throughput requires rigid resins with high binding capacities and recoveries at high flow rates, withstanding harsh purification procedures.

Static vs dynamic binding capacities

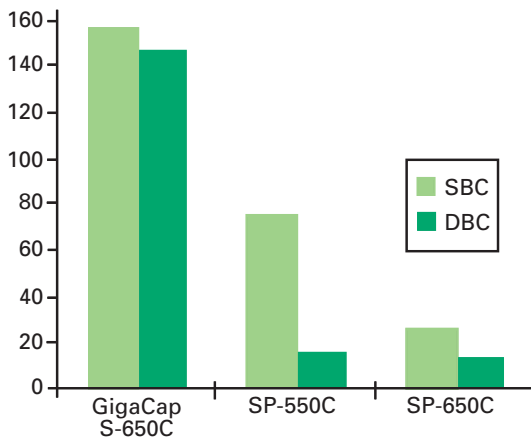


Figure 1: Comparison between static and dynamic binding capacity for human igG

GigaCap S is the first in a family of ion exchange resins optimized for high throughput chromatography. It is a strong cation exchange resin, developed to meet the actual needs in high throughput purification of monoclonal antibodies and other proteins by packed bed chromatography at process scale.

GigaCap S-650M breakthrough curves at different linear velocities

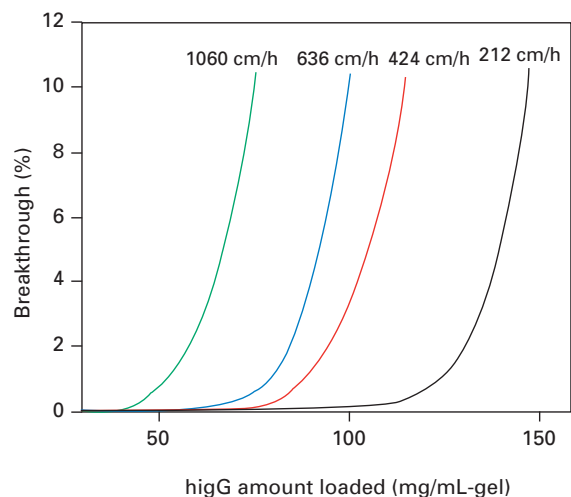


Figure 2: Breakthrough curves

**Conditions:**  
 10% height breakthrough curves of human IgG on cation exchange resins.  
 Column size: 6 mm ID x 4 cm L bed height  
 Sample: Polyclonal human IgG (1 mg/mL)  
 Buffer: 0.1 mol/L acetate buffer (pH 4.7)  
 Flow velocity: 212, 424, 636, 1060 cm/h  
 Detection: UV@280nm

### Insulin binding capacity for different resins

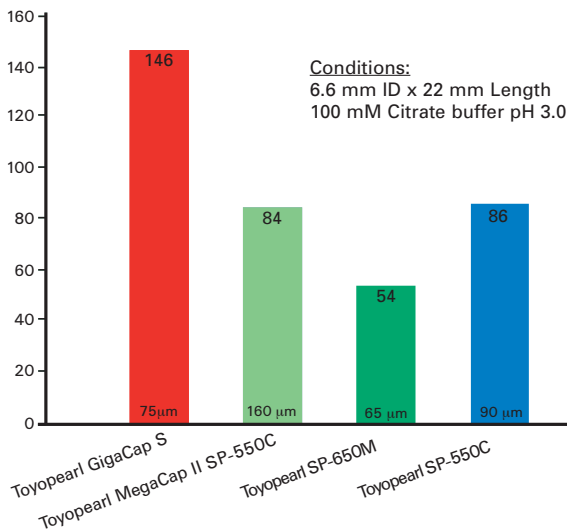


Figure 3: Dynamic Insulin binding capacities

### High capacity resins for IEC

GigaCap resins are based on the well proven methacrylic polymer backbone of Toyopearl and TSK-GEL media. GigaCap S combines excellent pressure flow characteristics (Figure 4) with unmatched dynamic binding capacities and high recoveries for both IgGs and smaller proteins. Latest surface modification technology was applied to increase the content of functional groups at the particle surface thus reaching binding capacities up to 150 mg IgG per ml resin (Figure 1, 2). A similar binding capacity can be achieved for smaller proteins like Insulin (Figure 3).

GigaCap S-650M shows an excellent chemical stability resulting in a minimal loss of IgG capacity after exposure to 1M NaOH for 5 weeks (Figure 5) or 50 CIPs (1 hour dwell time). Toyopearl GigaCap S-650M is therefore ideally suited for process scale protein purification.

### Pressure flow curves

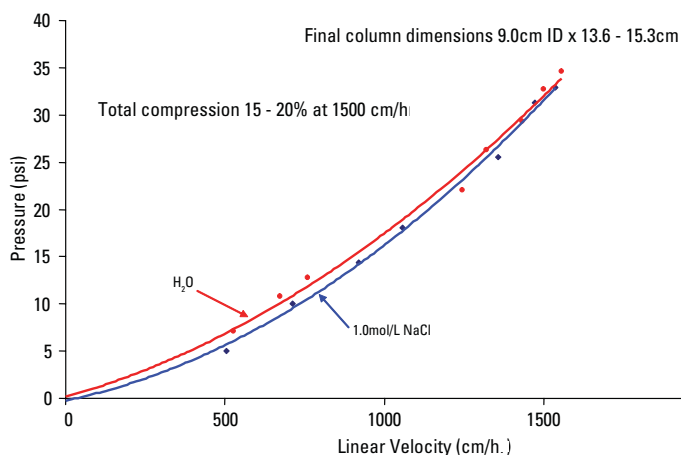


Figure 4: Pressure flow characteristics

### Alkaline stability

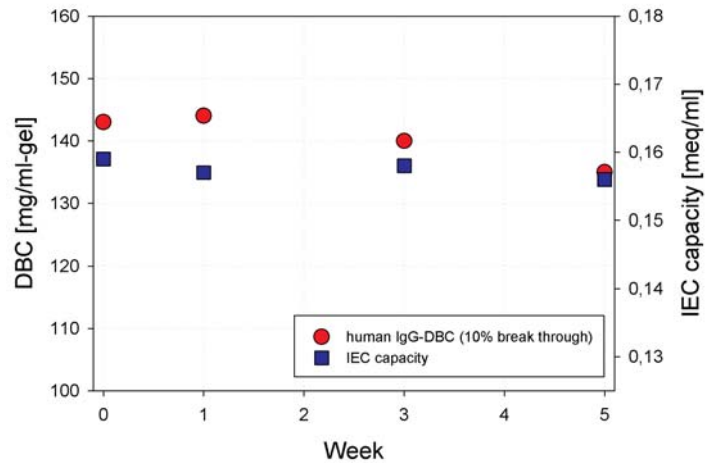


Figure 5: Toyopearl GigaCap S-650M Alkaline Stability

#### Conditions:

Toyopearl GigaCap S-650M is stored in 1 M NaOH solution at room temperature

evaluation period (soaking)	week	0	1	3	5
IEC capacity	meq/mL	0,159	0,157	0,158	0,156
hlgG-DBC (10% breakthrough)	mg/mL-gel	143	144	140	135
hlgG-recovery	%	99	101	100	99

**For further details of choice and selection of the Toyopearl® resin that best suits your particular process purification needs, please contact us:**

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### Ordering information

#### Toyopearl GigaCap S-650M

Particle Size: 50 - 100 µm  
Ion Exchange Capacity: 0,1 - 0,2 meq/ml resin

Part-No	Description	Resin Volume
21833	Toyopearl GigaCap S-650M	100 ml
21834	Toyopearl GigaCap S-650M	250 ml
21835	Toyopearl GigaCap S-650M	1 l
21836	Toyopearl GigaCap S-650M	5 l
21837	Toyopearl GigaCap S-650M	50 l
21868	ToyoScreen GigaCap S-650M	1 ml x 6 ea.
21869	ToyoScreen GigaCap S-650M	5 ml x 6 ea.