## Thermo Scientific Dionex Bio-IC Column Selection Guide

### Dionex CarboPac And Dionex AminoPac Columns

<table>
<thead>
<tr>
<th>Column</th>
<th>Format (Capacity µeq/col)</th>
<th>Recommendations</th>
<th>Official Methods/Target Applications</th>
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<tbody>
<tr>
<td>Thermo Scientific™ Dionex™ CarboPac™ PA200</td>
<td>3 × 250 mm (35 µeq)</td>
<td>High resolution separations of charged and neutral oligosaccharides.</td>
<td>Separation of neutral and sialylated N-linked oligosaccharides from glycoproteins. Plant-derived oligosaccharides (e.g. maltodextrins, xylans, etc.).</td>
<td>AN 1050: Protein Glycosylation in Limited-Quantity Samples&lt;br&gt;AN 1013: Polysialic Acid Analysis&lt;br&gt;AN 215: Asparagine-Linked Oligosaccharides from Polyclonal IgG&lt;br&gt;AU 150: Plant-Derived Neutral Oligo- and Polysaccharides&lt;br&gt;AN 67: Determination of Plant-Derived Neutral Oligo- and Polysaccharides&lt;br&gt;AN 1091: Uronic Acids and Wood Sugars in Wood Based Hydrolysates&lt;br&gt;AN 202: HPAE-PAD Analysis of Mannose-6-Phosphate</td>
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<tr>
<td>Dionex CarboPac PA20</td>
<td>3 × 150 mm (65 µeq)&lt;br&gt;0.4 × 150 mm (1.16 µeq)</td>
<td>High-resolution separations of mono- and disaccharides with optimized resolution of glucosamine/galactose and glucose/mannose peak pairs. The capillary format requires high pressure IC for fastest runs.</td>
<td>USP L Designation – L69 Glycoprotein monosaccharides, sialic acids.</td>
<td>AN 253: Sialic Acids in Infant Formula&lt;br&gt;TN 40: Glycoprotein Monosaccharide Analysis&lt;br&gt;AN 1050: Protein Glycosylation in Limited-Quantity Samples&lt;br&gt;AU 180: Sialic Acids in Glycoprotein Hydrolysates by HPAE-PAD&lt;br&gt;AN 1091: Uronic Acids and Wood Sugars in Wood-Based Hydrolysates&lt;br&gt;AN 248: Lactose in Lactose-Free Milk Products by HPAE-PAD&lt;br&gt;AN 202: HPAE-PAD Analysis of Mannose-6-Phosphate&lt;br&gt;AN 233: Galactosamine Containing Organic Impurities in Heparin by HPAE-PAD&lt;br&gt;AN 197: Glucosamine in Dietary Supplements Using HPAE-PAD&lt;br&gt;AU 151: Sucralose in Reduced-Carbohydrate Colas Using HPAE-PAD&lt;br&gt;AN 159: Determination of Sucralose Using HPAE-PAD&lt;br&gt;AU 164: Glucosamine in Chondroitin Sulfate-Containing Dietary Supplements Using HPAE-PAD</td>
</tr>
<tr>
<td></td>
<td>3 × 30 mm (13 µeq)</td>
<td>Fast separation of N-acetyl- and N-glycolyneuraminic acids.</td>
<td>Sialic acid</td>
<td>AU 181: Rapid Screening of Sialic Acids in Glycoproteins</td>
</tr>
<tr>
<td>Dionex CarboPac MA1</td>
<td>4 × 250 mm (1450 µeq)</td>
<td>High-capacity, strong anion-exchange column for separation of small reduced sugars (sugar alcohols).</td>
<td>USP L Designation – L47 First Action AOAC Method 2011.18 - Myo-inositol (free and bound as phosphatidylinositol) Reduced mono and disaccharides in commercial sweeteners and other food products and reduced monosaccharides from glycoproteins.</td>
<td>AN 267: Analysis of Amino Glycoside Antibiotics&lt;br&gt;AN 246: Ethylene Glycol and Diethylene Glycol in a Sorbitol Solution&lt;br&gt;AN 122: Carbohydrates, Alcohols, and Glycols in Fermentation Broths&lt;br&gt;AN 117: Quantification of Carbohydrates and Glycols in Pharmaceuticals&lt;br&gt;AN 87: Sugar Alcohols in Confections and Fruit Juices by HPAE-PAD</td>
</tr>
<tr>
<td>Dionex CarboPac SA10</td>
<td>4 × 250 mm (290 µeq)&lt;br&gt;2 × 250 mm (73 µeq)</td>
<td>Fast and high capacity separation of mono- and disaccharides in biofuels, foods, and beverages.</td>
<td>Fast analysis of monosaccharides and disaccharides in various matrices.</td>
<td>AN 282: Biofuel Sugars by HPAE-PAD&lt;br&gt;AN 280: Carbohydrates in Coffee&lt;br&gt;AU 192: Carbohydrates in Biofuel Samples</td>
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- **Currently recommended columns.**
- **100% Solvent compatible with common organic solvents.**
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| Dionex CarboPac SA10-4µm | 4 × 250 mm (290 µeq) 2 × 250 mm (73 µeq) | High resolution fast and high capacity separation of mono- and disaccharides in biofuels, foods, and beverages. | High resolution fast analysis of monosaccharides and disaccharides in various matrices. | AN 1089: Carbohydrates in Acid wood Hydrolysates  
TN 146: Lactose and Lactulose in Milk Products |
| Thermo Scientific™ Dionex™ BorateTrap™ Column | 4 × 50 mm | Highly recommended for optimal performance during carbohydrate analysis to remove borate contamination from eluents. | Eliminates peak tailing for mannose, fructose, and reduced monosaccharides, resulting from borate contamination in the eluent. | |
| Thermo Scientific™ Dionex™ AminoTrap™ Column | 4 × 50 mm  
3 × 30 mm  
2 × 50 mm  
0.4 × 35 mm | An in-line pretreatment column designed to retain amino acids present in carbohydrate samples. | Column optimized to delay the elution of amino acids and small peptides in glycoprotein hydrolysates. | TN 40: Glycoprotein Monosaccharide Analysis  
TN 71: Eluent Preparation for High-Performance Anion-Exchange  
TN 133: HPAE-PAD Peak Area Response of Glycoprotein Oligosaccharides |
| Thermo Scientific™ Dionex™ AminoPac™ PA10 | 4 × 250 mm (240 µeq)  
2 × 250 mm (60 µeq)  
9 × 250 mm  
22 × 250 mm | Hydrophobic, polymeric, pellicular, anion-exchange resin for the separation of carbohydrates and amino acids. The capillary format requires high pressure IC for fastest runs. | Analysis of free amino acids, vitamins, amino sugars, carbohydrates, phosphorylated amino acids, and common oxidation products of sulfur-containing amino acids. | AN 179: Carbohydrate and Amino Acid Analysis  
AN 150: Amino Acids in Cell Cultures and Fermentation Broths  
AN 142: Tryptophan Using AAA-Direct  
TN 55: Screening of Matrices and Matrix Ingredients for AAA-Direct  
AN 130: Hydroxyllysine-Containing Peptide Using AAA-Direct  
TN 50: Amino Acid Content of Peptides by AAA-Direct |
| Thermo Scientific Dionex Carbohydrate Removal Cartridge (CRC) | 2 × 15 mm | In-line sample pretreatment cartridge for removal of carbohydrates from amino acid samples. | The Dionex CRC cartridge is an in-line pretreatment cartridge packed with cation-exchange resin to bind amino acids while carbohydrates go to waste. | |

- Currently recommended columns.
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| Dionex CarboPac PA100  | 4 × 250 mm (90 µeq)  
2 × 250 mm (23 µeq)  
9 × 250 mm  
22 × 250 mm | Separations of oligosaccharides released from glycoproteins. | Separation of closely related oligosaccharides (isomers) and neutral and charged oligosaccharides. | AN 1070: Inositol Phosphates in Dried Distillers Grains with Solubles  
AN 105: Glycosylation Analysis of Human Serum Transferrin Glycoforms  
TN 42: Glycoprotein Oligosaccharide Analysis Using High-Performance Anion-Exchange Chromatography  
AN 67: Determination of Plant-Derived Neutral Oligo- and Polysaccharides  
AN 46: Ion Chromatography: A Versatile Technique for the Analysis of Beer |
| Dionex CarboPac PA10   | 4 × 250 mm (100 µeq)  
2 × 250 mm (25 µeq)  
0.4 × 250 mm (1 µeq)  
9 × 250 mm  
22 × 250 mm | Separation of amino, neutral, and acidic monosaccharides.  
The capillary format requires high pressure IC for fastest runs. | USP L Designation – L46 Analysis of mono- and disaccharides in foods, drugs, and plants, and separates sialic acids with the addition of sodium acetate to the eluent. | AN 117: Carbohydrates and Glycols in Pharmaceuticals  
TN 41: Sialic Acids Using HPAE-PAD  
AU 141: N-Acetylenameric Acid and N-Glycolenameric Acid Peak Area Responses  
TN 53: Glycoprotein Monosaccharide Composition by HPAE-PAD Using On-Line Electrolytically Generated Eluents |
| Dionex CarboPac PA1    | 4 × 250 mm (100 µeq)  
2 × 250 mm (25 µeq)  
9 × 250 mm  
22 × 250 mm | Rugged all-purpose column for determining monosaccharides, disaccharides and oligosaccharides. | AOAC Method 995.13 - Carbohydrates in Soluble Coffee  
AOAC Method 996.04 - Sugars in Molasses  
Method 997.08 - Fructans in Food and Food Products  
AOAC Method 2000.11 - Polydextrose  
AOAC Method 2000.17 - Low-Level Glucose and Fructose in Raw and Refined Sugar  
AOAC Method 2001.02 - Transgalacto-oligosaccharides First Action AOAC Method 2011.18 - Myo-inositol (free and bound as phosphatidylinositol)  
USP L Designation – L46 Anion-exchange column for the separation of mono-, disaccharides, oligosaccharides, and aminoglycosides. | AN 186: Paromomycin by HPAE-PAD  
AN 66: Neomycin B and Impurities by HPAE-PAD  
AN 147: Polydextrose in Foods by AOAC Method 2000.11  
AN 92: Sugars in Molasses by HPAE-PAD  
AN 82: Analysis of Fruit Juice Adulterated with Medium Invert Sugar from Beets  
AU 167: Tobramycin in Crude and In-Process Production Samples During Manufacturing Using HPAE-PAD  
AN 155: Trans-Galactooligosaccharides in Food by AOAC Method 2001.02  
AN 61: Determination of Tobramycin and Impurities Using HPAE-PAD |
| Dionex AminoPac PA1    | 4 × 250 mm (100 µeq) | High-speed, pellicular, strong, anion-exchange column for the separation of phosphorylated, acid labile and strongly acidic amino acids. | Acidic and acid-labile amino acids and for amino acid pairs not completely resolved by cation-exchange chromatography. |  

- Columns currently not recommended due to the availability of better performing columns. Columns are sold to accommodate customers using them in validated standard operating procedures.  
- Up to 90% compatible with common HPLC columns.  
- 2-5% compatible with common HPLC columns.  
- 100% Solvent compatible with common organic solvents.