# Capillary GC Columns and Guard Columns/Retention Gaps

Chiral Columns: *Group 2: Surface/Inclusion Interactions, Simple Derivatives*

## *Group 2: Surface/Inclusion Interactions, Simple Derivatives*

There are three different derivatives in this group:

- Astec CHIRALDEX® DM and Supelco DEX 325 (Dimethyl derivatives)
- Supelco DEX 225 (Diacetyl derivatives)
- Astec CHIRALDEX® PM, Supelco DEX 110, and Supelco DEX 120 (Permethyl derivatives)

The β-cyclodextrin has shown the greatest applicability for phases with these derivatives. **Astec CHIRALDEX® B-DM** is the recommended column in this category. The **Supelco β-DEX 325** is similar in both chemistry and use to the Astec CHIRALDEX® B-DM phase, the main difference being the concentration of the dimethyl-derivatized cyclodextrin that is doped into the polysiloxane polymer carrier.

The **Supelco β-DEX 225** is a modified form of the Supelco β-DEX 325 phase, employing acetyl derivatives at the 2,3-positions instead of more traditional methyl derivatives.

This group also includes the popular permethyl derivatives, and includes **Astec CHIRALDEX® B-PM**, **Supelco β-DEX 110**, and **Supelco β-DEX 120** phases. They are recommended as general purpose columns for the separation of a wide variety of compounds and are especially useful for the analysis of alcohols and diols in their underivatized form, as well as analytes with polar groups (such as tertiary amines). The main difference between these three phases is the concentration of the permethyl-derivatized cyclodextrin that is doped into the polysiloxane polymer carrier.

### Astec CHIRALDEX® B-DM Capillary GC Column

Through special derivatization techniques, the concentration of the cyclodextrin in the CHIRALDEX B-DM has been substantially increased in the polysiloxane carrier. This phase is very useful for a number of free acids and bases. The B-DM is able to perform most of the separations done on a beta-permethylated phase, but with higher resolution. The selectivity of the B-DM covers applications of both the B-PM and B-PH phases, although with superior performance.

**Temp. Limits:**

- -10 °C to 200 °C isothermal, 220 °C programmed

phase ..... non-bonded; 2,3-di-O-methyl-6-t-butyl silyl derivative of β-cyclodextrin

| I.D. (mm) | $d_f$ (µm) | Length (m) | Beta Value | Cat. No. | Qty |
|---|---|---|---|---|---|
| 0.25 | 0.12 | 20 | 500 | 77022AST | 1 ea |
| | 0.12 | 30 | 500 | 77023AST | 1 ea |
| | 0.12 | 40 | 500 | 77024AST | 1 ea |
| | 0.12 | 50 | 500 | 77025AST | 1 ea |

### Astec CHIRALDEX® G-DM Capillary GC Column

Incorporates a phase consisting of a 2,3-di-O-methyl-6-t-butyl silyl derivative of γ-cyclodextrin. This phase exhibits broad chiral selectivity, resolving aliphatic, olefenic, and aromatic enantiomers. It combines the selectivities of the PM and PH phases.

**Temp. Limits:**

- -10 °C to 200 °C isothermal, 220 °C programmed

phase ..... non-bonded; 2,3-di-O-methyl-6-t-butyl silyl derivative of γ-cyclodextrin

| I.D. (mm) | $d_f$ (µm) | Length (m) | Beta Value | Cat. No. | Qty |
|---|---|---|---|---|---|
| 0.25 | 0.12 | 30 | 500 | 77033AST | 1 ea |

### α-DEX™ 325

The chiral stationary phase in α-DEX 325 columns contains 2,3-di-O-methyl-6-0-TBDMS-α-cyclodextrin embedded in an intermediate polarity phase.

**Temp. Limits:**

- 30 °C to 230 °C

phase ..... non-bonded; 25% 2,3-di-O-methyl-6-O-TBDMS-α-cyclodextrin in SPB-20 poly(20% phenyl/80% dimethylsiloxane)

| I.D. (mm) | $d_f$ (µm) | Length (m) | Beta Value | Cat. No. | Qty |
|---|---|---|---|---|---|
| 0.25 | 0.25 | 30 | 250 | 24303 | 1 ea |

### β-DEX™ 325

The chiral stationary phase in β-DEX 325 columns contains 2,3-di-O-methyl-6-0-TBDMS-β-cyclodextrin embedded in an intermediate polarity phase. The Supelco β-DEX 325 is similar in both chemistry and use to the CHIRALDEX B-DM phase, the main difference being the concentration of the dimethyl-derivatized cyclodextrin that is doped into the polysiloxane carrier.

**Temp. Limits:**

- 30 °C to 230 °C

phase ..... non-bonded; 25% 2,3-di-O-methyl-6-O-TBDMS-β-cyclodextrin in SPB-20 poly(20% phenyl/80% dimethylsiloxane)

| I.D. (mm) | $d_f$ (µm) | Length (m) | Beta Value | Cat. No. | Qty |
|---|---|---|---|---|---|
| 0.25 | 0.25 | 30 | 250 | 24308 | 1 ea |

### γ-DEX™ 325

The chiral stationary phase in Supelco γ-DEX 325 columns contains 2,3-di-O-methyl-6-0-TBDMS-γ-cyclodextrin embedded in an intermediate polarity phase.

**Temp. Limits:**

- 30 °C to 230 °C

phase ..... non-bonded; 25% 2,3-di-O-methyl-6-O-TBDMS-γ-cyclodextrin in SPB-20 poly(20% phenyl/80% dimethylsiloxane)

| I.D. (mm) | $d_f$ (µm) | Length (m) | Beta Value | Cat. No. | Qty |
|---|---|---|---|---|---|
| 0.25 | 0.25 | 30 | 250 | 24306 | 1 ea |

### α-DEX™ 225

The chiral stationary phase in α-DEX 225 columns contains 2,3-di-O-acetyl-6-0-TBDMS-α-cyclodextrin embedded in an intermediate polarity phase.

**Temp. Limits:**

- 30 °C to 230 °C

phase ..... non-bonded; 25% 2,3-di-O-acetyl-6-O-TBDMS-α-cyclodextrin in SPB-20 poly(20% phenyl/80% dimethylsiloxane)

| I.D. (mm) | $d_f$ (µm) | Length (m) | Beta Value | Cat. No. | Qty |
|---|---|---|---|---|---|
| 0.25 | 0.25 | 30 | 250 | 24311 | 1 ea |

### β-DEX™ 225

The Supelco β-DEX 225 is a modified form of the β-DEX 325 phase, and employs acetyl derivatives at the 2,3-positions instead of more traditional methyl derivatives. The chiral stationary phase in β-DEX 225 columns contains 2,3-di-O-acetyl-6-0-TBDMS-β-cyclodextrin embedded in an intermediate polarity phase. These columns provide unique selectivity for enantiomeric separations of small molecules: alcohols, aldehydes (e.g., 2-phenylpropionaldehyde), esters (e.g. methyl malate, methyl lactate), flavor compounds and ketones.

**Temp. Limits:**

- 30 °C to 230 °C

phase ..... non-bonded; 25% 2,3-di-O-acetyl-6-O-TBDMS-β-cyclodextrin in SPB-20 poly(20% phenyl/80% dimethylsiloxane)

| I.D. (mm) | $d_f$ (µm) | Length (m) | Beta Value | Cat. No. | Qty |
|---|---|---|---|---|---|
| 0.25 | 0.25 | 30 | 250 | 24348 | 1 ea |