

Astec Chiraldex® GC Capillary Columns

- Resolve aromatic and nonaromatic enantiomers
- Pure cyclodextrin derivative coating
- No racemization of chiral stationary phase at elevated temperatures

Chiraldex® capillaries are based on derivatized cyclodextrins, which are chiral in nature formed by the α -1,4 linkage of glucose units into toroidal shaped structures. The enzyme cyclodextrin glucosyl transferase (CGT) cleaves partially digested starch and links the glucose units into predominantly three forms, referred to as alpha, beta, and gamma; 6, 7, and 8 glucose units, respectively. These cyclodextrins are thermally stable, highly crystalline and virtually insoluble in most organic solvents. Using the three forms of cyclodextrin, Astec has manufactured derivatives that exhibit properties allowing them to be used as GC phases. They are:

- Permethylated Hydroxypropyl (PH)
- Dialkylated (DA)
- Trifluoroacetylated (TA)
- Propionylated (PN)
- Butyrylated (BP)
- Permethylated (PM)
- Dimethylated (DM)

The prefix A, B, G describes the cyclodextrins alpha, beta, and gamma, respectively. The suffix describes the nature of the derivatization i.e., G-TA refers to Gamma Trifluoroacetylated phase.

The most striking characteristic of these phases is that they separate nonaromatic enantiomers including saturated alcohols, amines, carboxylic acids, epoxides, diols, polyols, cyclic, bicyclic, heterocyclic compounds, lactones, amino alcohols, amino acids, haloalkanes, α -halocarboxylic esters, pyrans, and furans. Little functionality is required for chiral recognition (**Table 1**). Also, there can be reversals of elution order from one series to the next as well as from one cavity size (beta) to another (gamma). The acylating reagent also can contribute to stereo-selectivity.

technical assistance

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Table 1—General Classes of Compounds Separated on Chiraldex™ Capillary Columns

Chiraldex® B-PH:	Most structural types of compounds including linear and cyclic amines and alcohols, carboxylic acids, lactones, amino alcohols, sugars, bicyclics, epoxides, haloalkanes, and more
Chiraldex® B-DA:	Nitrogen heterocyclics, heterocyclics, some bicyclics, and epoxides, lactones, aromatic amines, sugars, amino acid derivatives
Chiraldex® A-TA:	Smaller alcohols, amino alcohols, amino alkanes, and diols
Chiraldex® B-TA:	Broad range alkyl alcohols, halo acid esters, amino alkanes, halocycloalkanes, certain lactones, diols, alkyl halides, furan and pyran derivatives
Chiraldex® G-TA:	>350 pairs chiral alcohols, diols, polyols, hydrocarbons, lactones, amine alcohols, halocarboxylic acid esters, homologous series, furan and pyran derivatives, epoxides, glycidyl analogs, and haloepihydrins
Chiraldex® G-PN:	Epoxides, higher alcohols >C4, lactones
Chiraldex® G-BP:	Amino acids, certain primary amines and furans
Chiraldex® B-PM:	Acids, alcohols, barbitals, diols, epoxides, esters, hydrocarbons, ketones, lactones, and terpenes
Chiraldex® B-DM:	Selectivity similar to PM and PH, but with shorter retention times, and greater resolution. Especially applicable to aliphatic, olefinic, and aromatic enantiomers

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Phase	Length	i.d.	Film	Temp. Limits*	Part No.
<i>B-PM</i>	30m	0.25mm	0.125µm	230/250°C	4711
<i>A-TA</i>	30m	0.25mm	0.125µm	180/180°C	4127
<i>B-TA</i>	30m	0.25mm	0.125µm	180/180°C	4133
<i>G-TA</i>	20m	0.25mm	0.125µm	180/180°C	4137
	30m	0.25mm	0.125µm	180/180°C	4139
	50m	0.25mm	0.125µm	180/180°C	4639
<i>B-PH</i>	30m	0.25mm	0.125µm	200/220°C	4094

*Isothermal/Temp. program.

Chiraldex® Capillary Columns

Phase	Length	i.d.	Film	Temp. Limits*	Part No.
<i>B-DA</i>	20m	0.25mm	0.125µm	200/220°C	4113
<i>G-PN</i>	30m	0.25mm	0.125µm	200/220°C	4668
<i>G-BP</i>	30m	0.25mm	0.125µm	200/220°C	4670
<i>B-DM</i>	30m	0.25mm	0.125µm	230/250°C	4727

*Isothermal/Temp. program.

tech tip

Temperature Limits

Our GC capillary columns are temperature rated. In some cases, we list two maximum operating temperatures, the lower one is for isothermal condition and the higher one for temperature-programmed condition.