

## Short User Manual for ChiralAMCD Columns

Please visit English website <http://chiraltek-column.com/Downloads.php> or Chinese website <http://cbook.antpedia.com/6755> for downloading the full product manual and application notes for the ChiralAMCD columns.

All ChiralAMCD columns have been passed the quality control tests. Please kindly refer to the “Certificate of Quality Control Analysis” for information about the testing results. The column was stored in IPA/MeOH (50:50, v/v) before delivery. Please carefully read this user manual before using the column.

### 1. Unique Characteristics for ChiralAMCD columns

ChiralAMCD columns are the first type of chemically-modified amylose-appended cyclodextrin-bonded silica particles-packed chiral columns (shown in Figure (A)). The ChiralAMCD particles were prepared through a specially-designed procedure by bonding the different functional groups-substituted amylose-appended cyclodextrin (AMCD) onto surface of high-quality porous silica (2 μm or 3 μm for analytical columns). The column contains a unique complex chiral selector with two recognition moieties: amylose and cyclodextrin.

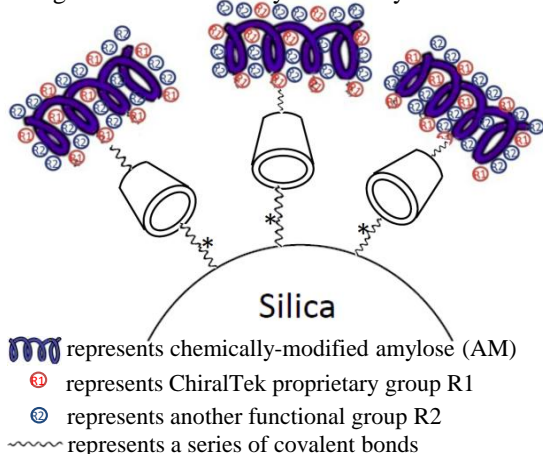


Figure (A). Schematic diagram of the ChiralAMCD phase

Other manufacturers' columns contain a single type of chiral selector (e.g., amylose, or cyclodextrin, etc). The ChiralAMCD column contains both amylose and cyclodextrin. Figure (B) shows the schematic structure of the chemically-modified amylose-appended cyclodextrin selector in ChiralAMCD column. Due to the cooperative functioning of the amylose and cyclodextrin, the ChiralAMCD columns can provide different and generally better chiral separation abilities for a wider range of chiral compounds.



: Cyclodextrin (CD); : Amylose (AM)  
 ChiralAMCD-1: R2= Phenylcarbamate;  
 ChiralAMCD-2: R2= 3,5-Dimethylphenylcarbamate;  
 ChiralAMCD-3: R2= 3-Chloro-4-methyl-phenylcarbamate.

Figure (B). Schematic diagram of the AMCD complex chiral selector of the ChiralAMCD phases

### 2. Application and Requirements

The ChiralAMCD columns can be used under multiple modes of mobile phase conditions. For use under reversed-phase conditions, the columns need to be firstly flushed with methanol following by mobile phase until reaching a constant column pressure. Similarly, for use under normal phase conditions, the columns need to be flushed with isopropanol following by mobile phase until achieving a stable baseline signal. A common C18 guard column can be used for reversed-phase conditions and a Diol guard column can be used for normal phase conditions. If non-standard mobile phases are to be used, please contact ChiralTek for technical support.

Since packing particles and inner diameter (2 mm) of the ChiralAMCD analytical columns are quite small, a low flow rate (e.g., 0.1-0.3 mL/min) should be applied when used in traditional HPLC with highly viscous mobile phases in order to avoid high back pressure. However, there is no special flow rate limitation for use in UPLC.

Flow direction:	Arrow direction on the label
Pressure:	< 860 bar (~12500 psi)
Temperature:	0 – 40 °C
Guard column:	Standard C18 or Diol column
LC mode:	HPLC or UPLC

### 3. Care and Maintenance of the ChiralAMCD Columns

[1] It is strongly recommended to use standard C18 or Diol guard columns to protect the ChiralAMCD columns;  
 [2] It'd better to resolve samples in mobile phases and filter through 0.5 μm membrane before injection;  
 [3] The solvent in the ChiralAMCD columns should be replaced with Methanol (reversed phase conditions) or IPA (normal phase conditions) if the columns need to be stored for over a week's time.

[4] The ChiralAMCD columns can be easily cleaned by flushing with 100% methanol (reversed phase conditions) or 100% IPA (normal phase conditions) at a proper flow rate for 3 hours.

[5] When worked in high pressure conditions, it's strongly recommended to gradually decrease flow rate to ensure column pressure lower than 100 bar (~1450 psi) before switching off the chromatograph pump.

#### 4. Notice and Other Considerations

[1] The ChiralAMCD columns can be used under normal phase, reversed phase, and polar organic mobile phase conditions. It is strongly recommended to use 100% IPA as intermediate solvent when switching between different mobile phase conditions. Due to the high viscosity of the IPA, a low flow rate of about 0.1 mL/min should be applied in traditional HPLC in order to avoid extreme high pressure. However, there is no special flow rate limitation for UPLC.

[2] Diethylamine, butylamine, or amino ethyl alcohol (0.1%) can be used as mobile phase additives for basic compounds.

[3] Formic acid, acetic acid, or trifluoroacetic acid (0.1%) can be used as mobile phase additives for acidic compounds.

[4] Since the strong alkalic compounds (e.g., NaOH etc.) can cause damages to the ChiralAMCD column bed, they cannot be used as mobile phase additives or sample solution additives.

#### 5. List of the ChiralAMCD Columns with Different Specifications

Product List of ChiralAMCD Columns from ChiralTek			
Part Number	Type	Dimension	Description
862-AMCD1-01	ChiralAMCD-1	2 $\mu$ m, 50 $\times$ 2mm	AMCD-1 bonded analytical column
862-AMCD1-02	ChiralAMCD-1	2 $\mu$ m, 100 $\times$ 2mm	AMCD-1 bonded analytical column
862-AMCD1-03	ChiralAMCD-1	2 $\mu$ m, 150 $\times$ 2mm	AMCD-1 bonded analytical column
862-AMCD1-04	ChiralAMCD-1	2 $\mu$ m, 200 $\times$ 2mm	AMCD-1 bonded analytical column
862-AMCD1-05	ChiralAMCD-1	2 $\mu$ m, 250 $\times$ 2mm	AMCD-1 bonded analytical column
863-AMCD1-01	ChiralAMCD-1	3 $\mu$ m, 50 $\times$ 2mm	AMCD-1 bonded analytical column
863-AMCD1-02	ChiralAMCD-1	3 $\mu$ m, 100 $\times$ 2mm	AMCD-1 bonded analytical column
863-AMCD1-03	ChiralAMCD-1	3 $\mu$ m, 150 $\times$ 2mm	AMCD-1 bonded analytical column
863-AMCD1-04	ChiralAMCD-1	3 $\mu$ m, 200 $\times$ 2mm	AMCD-1 bonded analytical column
863-AMCD1-05	ChiralAMCD-1	3 $\mu$ m, 250 $\times$ 2mm	AMCD-1 bonded analytical column
863-AMCD2-01	ChiralAMCD-2	3 $\mu$ m, 50 $\times$ 2mm	AMCD-2 bonded analytical column
863-AMCD2-02	ChiralAMCD-2	3 $\mu$ m, 100 $\times$ 2mm	AMCD-2 bonded analytical column
863-AMCD2-03	ChiralAMCD-2	3 $\mu$ m, 150 $\times$ 2mm	AMCD-2 bonded analytical column
863-AMCD2-04	ChiralAMCD-2	3 $\mu$ m, 200 $\times$ 2mm	AMCD-2 bonded analytical column
863-AMCD2-05	ChiralAMCD-2	3 $\mu$ m, 250 $\times$ 2mm	AMCD-2 bonded analytical column
863-AMCD3-01	ChiralAMCD-3	3 $\mu$ m, 50 $\times$ 2mm	AMCD-3 bonded analytical column
863-AMCD3-02	ChiralAMCD-3	3 $\mu$ m, 100 $\times$ 2mm	AMCD-3 bonded analytical column
863-AMCD3-03	ChiralAMCD-3	3 $\mu$ m, 150 $\times$ 2mm	AMCD-3 bonded analytical column
863-AMCD3-04	ChiralAMCD-3	3 $\mu$ m, 200 $\times$ 2mm	AMCD-3 bonded analytical column
863-AMCD3-05	ChiralAMCD-3	3 $\mu$ m, 250 $\times$ 2mm	AMCD-3 bonded analytical column
833-SK1-03	ChiralKit-1	3 $\mu$ m, 150 $\times$ 2mm	Screening Kit-1 (3 analytical columns)
833-SK2-03	ChiralKit-2	3 $\mu$ m, 150 $\times$ 2mm	Screening Kit-2 (6 analytical columns)

ChiralAMCD columns with other dimensions are also available. This manual may not be updated on time, please visit English website <http://chiraltek-column.com/Downloads.php> or Chinese website <http://cbook.antpedia.com/6755> for downloading the latest version of full product manual and application notes for ChiralAMCD columns. Please call an international phone number (+65)-93656129 to directly contact ChiralTek technical support team in Singapore. You also can call a special local phone number (+86)-95040358310 in the mainland of China to directly contact ChiralTek support team in Singapore.