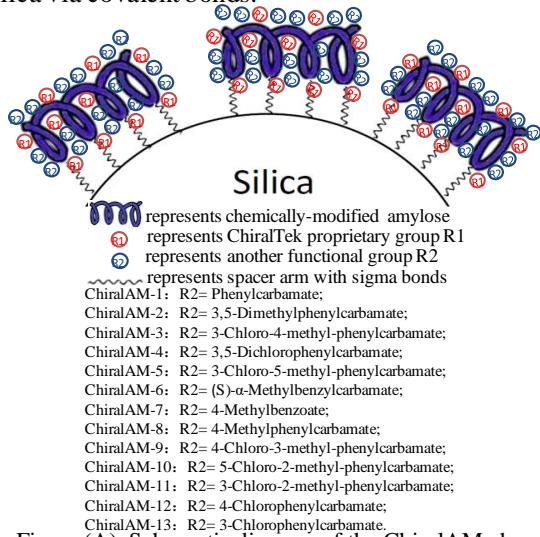




All ChiralAM columns have been passed the quality control tests. Please kindly refer to the "Certificate of Quality Control Analysis" for information about the testing results. The column was stored in 100% MeOH before delivery. Please carefully read this user manual before using the ChiralAM column.

## 1. Unique Characteristics for ChiralAM columns

ChiralAM columns are a new type of chemically-modified amylose-immobilized silica particles-packed chiral columns. The ChiralAM particles were prepared through a specially-designed one-step reaction procedure by bonding the different functional groups-substituted amylose onto surface of high-quality porous silica (2  $\mu\text{m}$ , 3  $\mu\text{m}$ , 5  $\mu\text{m}$ , or 10  $\mu\text{m}$ ). Therefore, high column efficiency can be easily achieved on the ChiralAM columns. As shown in Figure (A), the amyloses were anchored onto silica via covalent bonds.



## 2. Application and Requirements

The ChiralAM columns can be used under multiple modes conditions. For use under reversed-phase conditions, the columns need to be firstly flushed with methanol following by mobile phase until reaching a constant pressure. Similarly, for use under normal phase conditions, the columns need to be flushed with ethanol or isopropanol following by mobile phase until achieving a stable baseline signal. A ChiralAM or 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.

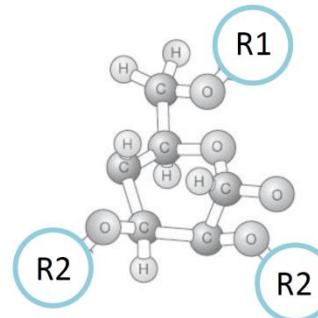
## 3. Care and Maintenance of the ChiralAM Columns

- [1] It is strongly recommended to use ChiralAM, C18 or Diol guard columns to protect the ChiralAM columns;
- [2] It'd be better to resolve samples in mobile phases and filter through 0.5  $\mu\text{m}$  membrane before injection;
- [3] The solvent in the ChiralAM columns should be replaced with methanol (reversed phase conditions) or ethanol / IPA (normal phase conditions) if the columns need to be stored for over a week's time.

## Short User Manual for ChiralAM Columns

Please visit English website <http://chiraltek-column.com/Downloads.php> for downloading the full product manual and application notes for the ChiralAM columns.

The chemical structure of the chiral selectors of ChiralAM phases are different from other supplier's amylose-based phases. The typical structure of the bonded amylose selector unit in ChiralAM columns is showed in the following Figure (B). Since the novel ChiralAM phases from ChiralTek have higher content of the immobilized amyloses and contain more types of functional groups, the ChiralAM columns can provide different and generally better chiral separation abilities than other supplier's amylose-immobilized columns.



R1 is a ChiralTek proprietary chiral group;  
R2 is another common functional group.

Figure (B). Typical structure of general chiral selector unit of the ChiralAM phases

When using ChiralAM columns with 2  $\mu\text{m}$  and 3  $\mu\text{m}$  particles, 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, 2 $\mu\text{m}$ , 3 $\mu\text{m}$ ) < 600 bar (~9000 psi, 5 $\mu\text{m}$ , HPLC)
Temperature:	0 – 40 °C
Guard column:	ChiralAM, C18, or Diol column
Mode:	HPLC, SFC, or UPLC

[4] The ChiralAM columns can be easily cleaned by flushing with 100% methanol (reversed phase conditions) or 100% ethanol (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 ChiralAM columns can be used under normal phase, reversed phase, and polar organic mobile phase conditions. It is strongly recommended to use 100% ethanol (or 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 ChiralAM column bed, they cannot be used as mobile phase additives or sample solution additives.

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

**Product List of Some ChiralAM Immobilized Columns from ChiralTek**

Part Number	Type	Dimension	Description
852-AM1-01	ChiralAM-1	2μm, 120Å, 50 × 2.1mm	2μm Phenylcarbamate-amylose immobilized AM-1 column
8552-AM2-02	ChiralAM-2	2μm, 500Å, 100 × 2.1mm	2μm 3,5-Dimethylphenylcarbamate-amylose immobilized AM-2 column
8952-AM3-03	ChiralAM-3	2μm, 1000Å, 150 × 2.1mm	2μm 3-Chloro-4-methylphenylcarbamate-amylose immobilized AM-3 column
8553-AM4-04	ChiralAM-4	3μm, 500Å, 200 × 2.1mm	3μm 3,5-Dichlorophenylcarbamate-amylose immobilized AM-4 column
8553-AM5-01	ChiralAM-5	3μm, 500Å, 50 × 2.1mm	3μm 3-Chloro-5-methylphenylcarbamate-amylose immobilized AM-5 column
8553-AM6-02	ChiralAM-6	3μm, 500Å, 100 × 2.1mm	3μm (S)-α-Methylbenzylcarbamate-amylose immobilized AM-6 column
8553-AM7-61	ChiralAM-7	3μm, 500Å, 50 × 4.6mm	3μm 4-Methylbenzoate-amylose immobilized AM-7 column
8553-AM8-62	ChiralAM-8	3μm, 500Å, 100 × 4.6mm	3μm 4-Methylphenylcarbamate-amylose immobilized AM-8 column
8553-AM9-03	ChiralAM-9	3μm, 500Å, 150 × 2.1mm	3μm 4-Chloro-3-methylphenylcarbamate-amylose immobilized AM-9 column
8553-AM10-04	ChiralAM-10	3μm, 500Å, 200 × 2.1mm	3μm 5-Chloro-2-methylphenylcarbamate-amylose immobilized AM-10 column
8553-AM11-05	ChiralAM-11	3μm, 500Å, 250 × 2.1mm	3μm 3-Chloro-2-methylphenylcarbamate-amylose immobilized AM-11 column
8953-AM12-01	ChiralAM-12	3μm, 1000Å, 50 × 2.1mm	3μm 4-Chlorophenylcarbamate-amylose immobilized AM-12 column
8953-AM5-61	ChiralAM-5	3μm, 1000Å, 50 × 4.6mm	3μm 3-Chloro-5-methylphenylcarbamate-amylose immobilized AM-5 column
8953-AM5-62	ChiralAM-5	3μm, 1000Å, 100 × 4.6mm	3μm 3-Chloro-5-methylphenylcarbamate-amylose immobilized AM-5 column
8953-AM5-03	ChiralAM-5	3μm, 1000Å, 150 × 2.1mm	3μm 3-Chloro-5-methylphenylcarbamate-amylose immobilized AM-5 column
8953-AM5-04	ChiralAM-5	3μm, 1000Å, 200 × 2.1mm	3μm 3-Chloro-5-methylphenylcarbamate-amylose immobilized AM-5 column
8953-AM5-05	ChiralAM-5	3μm, 1000Å, 250 × 2.1mm	3μm 3-Chloro-5-methylphenylcarbamate-amylose immobilized AM-5 column
8955-AM2-05	ChiralAM-2	5μm, 1000Å, 250 × 4.6mm	5μm 3,5-Dimethylphenylcarbamate-amylose immobilized AM-2 column
8955-AM3-05	ChiralAM-3	5μm, 1000Å, 250 × 4.6mm	5μm 3-Chloro-4-methylphenylcarbamate-amylose immobilized AM-3 column
8955-AM4-05	ChiralAM-4	5μm, 1000Å, 250 × 4.6mm	5μm 3,5-Dichlorophenylcarbamate-amylose immobilized AM-4 column
8955-AM5-05	ChiralAM-5	5μm, 1000Å, 250 × 4.6mm	5μm 3-Chloro-5-methylphenylcarbamate-amylose immobilized AM-5 column
8955-AM6-05	ChiralAM-6	5μm, 1000Å, 250 × 4.6mm	5μm (S)-α-Methylbenzylcarbamate-amylose immobilized AM-6 column
7955-AM3-14	ChiralAM-3	5μm, 1000Å, 200 × 10.0mm	5μm 3-Chloro-4-methylphenylcarbamate-amylose AM-3 preparative column
7955-AM5-25	ChiralAM-5	5μm, 1000Å, 250 × 20.0mm	5μm 3-Chloro-5-methylphenylcarbamate-amylose AM-5 preparative column
8933-SK1-61	ChiralKit-1	3μm, 1000Å, 50 × 4.6mm	Screening Kit-1 (3 analytical columns)
8933-SK2-61	ChiralKit-2	3μm, 1000Å, 50 × 4.6mm	Screening Kit-2 (6 analytical columns)

ChiralAM columns with other dimensions are also available. This manual may not be updated on time, please visit English website <http://chiraltex-column.com/Downloads.php> for downloading the latest version of full product manual and application notes for ChiralAM 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.