

## Astec Cellulose DMP Care and Use Instructions

- **Description:** Spherical, porous silica coated with DMPC (dimethylphenyl carbamate)-derivatized cellulose.
- **Field of Use:** Small molecule enantiomer separations in normal phase, polar organic or SFC modes.
- **Column Conditioning:** Astec Cellulose DMP columns are shipped in 90:10 hexane:IPA. Before use, the column should be equilibrated using the desired mobile phase with a flow rate that does not submit the column to pressures exceeding 200 bar (2900 psi).
- **Compatible Mobile Phases:** Acceptable mobile phase solvents include alkanes (heptane, hexane), alcohols (methanol, ethanol, isopropanol), and acetonitrile.
- **Incompatible Mobile Phases and Sample Solvents:** Incompatible mobile phase and sample solvents include polar aprotic solvents (e.g. acetone, ethylacetate, THF, DMF, DMSO, dioxane, etc.), halogenated solvents (e.g.  $\text{CH}_2\text{Cl}_2$ ,  $\text{CHCl}_3$ , etc.). Do not use these solvents and mobile phases. Do not inject samples that are dissolved in these solvents.
- **Additives:** Additives up to 0.1% v/v or w/v in the mobile phase are used to improve peak shape and selectivity. Common additives include DEA, TEA, TFA, acetic acid, formic acid and methane sulfonic acid.
- **Flow Rate:** The optimal flow rate for 4.6 mm I.D. columns is 0.5 – 0.6 mL/min. The table below gives the optimal flow rate for columns of other internal diameters. Flow rate is not limited, except to keep the total pressure below 200 bar.

Column I.D. (mm)	Opt. Flow Rate (mL/min.) Equivalent to $u_{\text{opt}}$ of 0.8 mm/sec.	Column I.D. (mm)	Opt. Flow Rate (mL/min.) Equivalent to $u_{\text{opt}}$ of 0.8 mm/sec.
1	0.03	10	2.5
2.1	0.1	21.2	12
3	0.2	30	24
4.6	0.5	50	66

- **Pressure:** The maximum suggested operating pressure for the cellulosic columns is 200 bar (2900 psi).
- **Temperature:** 5 °C to 40 °C.

Typical range	5 - 40 °C
Increased temperature	Generally increases efficiency and improves peak shape
Decreased temperature	Generally increases chiral selectivity (enhances the weaker bonding forces)
Maintain temperature	To within +/- 1% °C to maximize reproducibility.

- **Column Protection:** Follow good HPLC practice. We recommend using guard columns and in-line filters to protect the column. Mobile phases and samples should be filtered.
- **Column Storage:** Never leave a column stored in mobile phase with organic additives. The column should be washed with unmodified mobile phase and returned to 90:10 hexane:IPA or heptane:IPA for storage. When analysis is complete, the column should be flushed with and stored in 90:10 heptane:IPA or hexane:IPA.

## Method Development Protocols and Suggestions

Mobile Phase System	Starting Conditions
Normal phase (NP)	20:80:0.1, IPA:Heptane/DEA (for bases) or TFA (for acids and neutrals)
Polar organic (POM)	Methanol:Ethanol, 50:50; Acetonitrile
SFC	10% Methanol in CO <sub>2</sub>

## Optimization Parameters

Mobile Phase System	Approach
Polar organic (POM)	Use pure methanol or ethanol. Add 5% of either alcohol to acetonitrile.
Normal phase (NP)	Change the % IPA. Try other alcohols (methanol, ethanol). For bases use methanesulfonic acid or ethanesulfonic acid as an additive.

## Optimization for MS and other evaporative detectors

In polar organic mode, use ammonium formate as an additive.

## Additional Products

Cat. No.	Description
<b>Columns</b>	
51100AST	Astec Cellulose DMP, 15 cm x 2.1 mm, 5 µm particles
51101AST	Astec Cellulose DMP, 25 cm x 2.1 mm, 5 µm particles
51097AST	Astec Cellulose DMP, 10 cm x 4.6 mm, 5 µm particles
51098AST	Astec Cellulose DMP, 15 cm x 4.6 mm, 5 µm particles
51099AST	Astec Cellulose DMP, 25 cm x 4.6 mm, 5 µm particles
51102AST	Astec Cellulose DMP, 25 cm x 10 mm, 5 µm particles
51103AST	Astec Cellulose DMP, 25 cm x 21.2 mm, 5 µm particles
<b>Guard Cartridges</b>	
51105AST	Astec Cellulose DMP, 2 cm x 2.1 mm Guard Kit
51104AST	Astec Cellulose DMP, 2 cm x 2.1 mm Guard Cartridges, pack of 2
51107AST	Astec Cellulose DMP, 2 cm x 4 mm Guard Kit
51106AST	Astec Cellulose DMP, 2 cm x 4 mm Guard Cartridges, pack of 2
51108AST	Astec Cellulose DMP, 1 cm x 10 mm Guard Cartridge
51109AST	Astec Cellulose DMP, 1 cm x 21.2 mm Guard Cartridge
<b>Holders for Guard Cartridges</b>	
59660-U	Holder for 2 cm x 2.1 mm and 4 mm I.D. Guard Cartridges
567499-U	Holder for 1 cm x 10 mm I.D. Guard Cartridges
581392-U	Holder for 1 cm x 21.2 mm I.D. Guard Cartridges