

# Cellufine™ GCL-2000HF

## Size exclusion chromatography resin with high physical strength and suitable for use on large columns

Cellufine GCL-2000HF is a size exclusion chromatography resin. The pore size of chemically stable spherical cellulose particles is controlled by our unique cross-linking technology. Cellulose is characterized by its higher physical strength than other polysaccharides due to its internal crystal structure. Therefore, it has excellent pressure resistance and excellent flow property, so Cellufine GCL-2000HF can be used on an industrial scale. In addition, it has a pore size optimized for protein separation, so it exhibits excellent separation performance. The characteristics of Cellufine GCL-2000HF are summarized in Table 1 below.

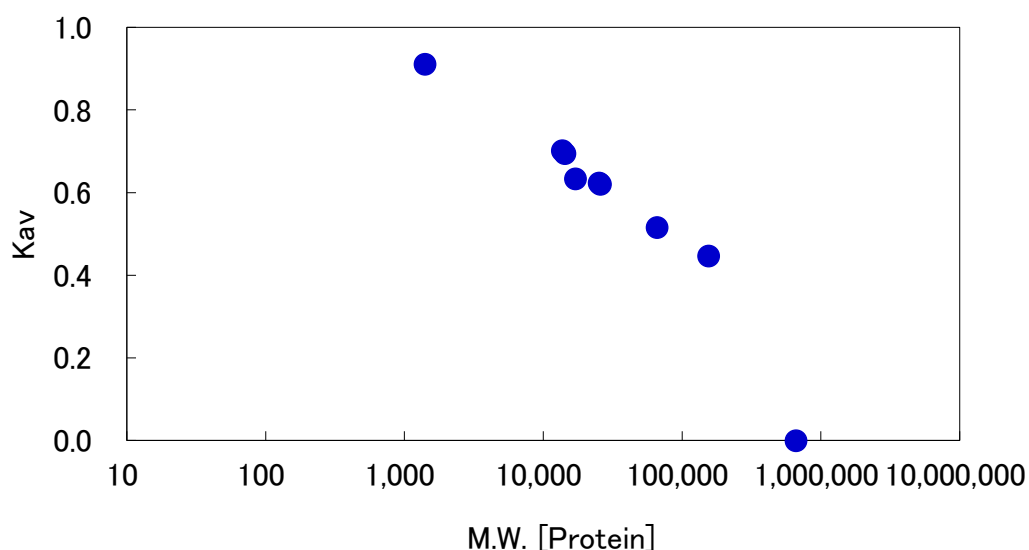
Table 1 Characteristics of Cellufine GCL-2000HF

Characteristics	
Base resin	Cross-linked cellulose particles
Particle shape	Spherical
Particle diameter	ca. 40-130 μm
Chemical stability	Resistant to many salts, surfactants, alkali and acid. For example, it is resistant to 8M urea, 6M guanidine / HCL, 0.1M HCL, 0.5M NaOH.
Mechanical strength	Particles don't break even when agitated with magnetic stirrer or peristaltic pump.
Change in particle shape	The resin is changed within 3% or less, when the ionic strength is changed.
Autoclave resistance	Autoclave can be used repeatedly.
Preservative solution	20 % ethanol

**Separation properties of proteins**

Cellufine GCL-2000HF can be separating proteins with a wide range of molecular weight. The results of measuring the Kav of Cellufine GCL-2000HF is shown below(Fig. 1, Table 1). Cellufine GCL-2000HF is designed to efficiently separate proteins with similar molecular weights by applying a unique cross-linking technology to cellulose particles with extremely large pores. Therefore, even proteins with similar molecular weights such as myoglobin (17,000 Da) and lysozyme (14,300 Da) have different Kav values and can be separated. Calibration curve indicate that 360,000 Da is the exclusion limit of Cellufine GCL-2000HF.

**Fig.1 Measurement of pore size with different size of proteins**



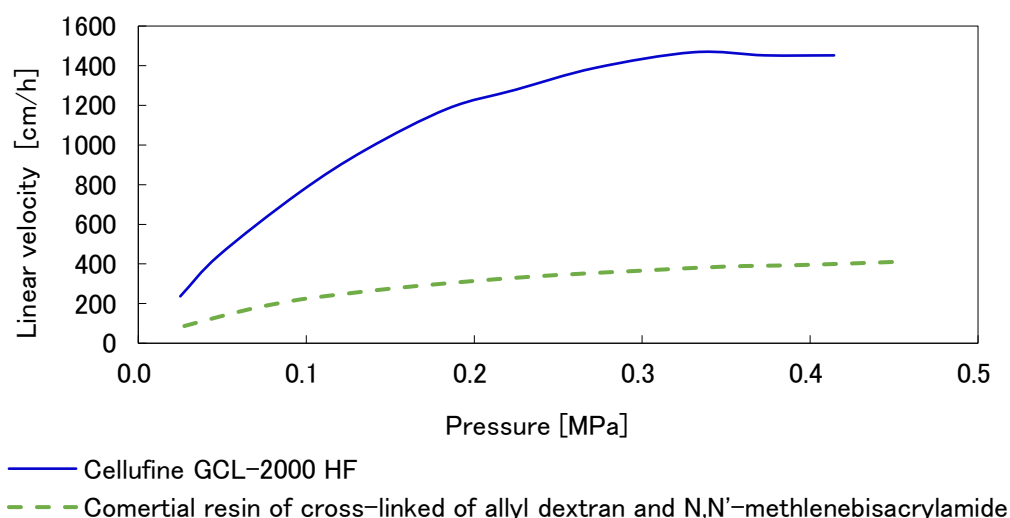
**Table 1 Relationship between proteins and Kav**

Protein	M.W.	Kav
Thyroglobulin	660,000	0.00
Human gamma globulin	155,000	0.45
BSA	66,000	0.52
Chymotrypsinogen A	25,700	0.62
α-chymotrypsin	25,200	0.62
Myoglobin	17,000	0.63
Lysozyme	14,300	0.70
Ribonuclease A	13,700	0.70
Bacitracin	1,400	0.91

**Flow property**

Cellufine GCL-2000HF has excellent physical strength due to its unique cross-linking technology. Therefore, it can be used with large columns which is mainly used in the manufacture of biopharmacy. The relationship between linear velocity and pressure loss is shown (Fig. 2). It exhibits extremely good flow rate characteristics compared to commercially available size exclusion chromatography resin.

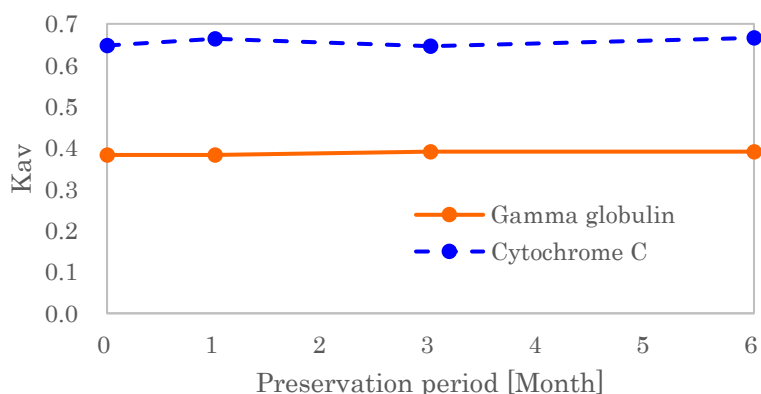
**Fig.2 The relationship between linear velocity and pressure**



**Excellent stability (accelerated test)**

Cellufine GCL-2000HF is a size exclusion chromatography resin cross-linked with cellulose particles that are extremely stable as a substance.

**Fig. 3 Stability when stored at 40 ° C**



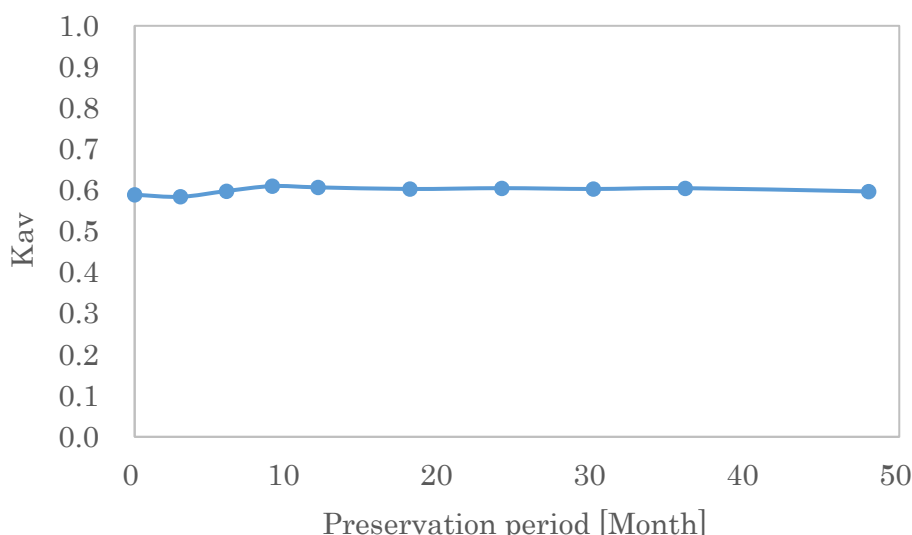
After storage in a 20% ethanol solution at a temperature of 40 ° C, the pore size was measured (Fig. 3). The pore size maintains a stable pore size even after 6 months.

Cellulose is a heat-stable polysaccharide. The agarose, which is commonly used as a chromatography resin, has many hydroxyl groups because it is the same polysaccharide as cellulose. Therefore, like cellulose, it has the characteristic of less non-specific adsorption of proteins. On the other hand, agarose is easily dissolved in hot water. For this reason, agarose has the disadvantage of being sensitive to heat. Although cellulose is a polysaccharide with hydroxyl groups, it has an extremely excellent feature of resistance for heat because of crystalline structure in it.

**Excellent stability (preservation test)**

Cellufine GCL-2000HF was stored at a temperature of 30 ° C in a 20% ethanol solution, and the subsequent changes in pore size were investigated (Fig. 4). It was found that Cellufine GCL-2000HF shows excellent stability over a long period.

**Fig.4 Long-term storage stability**



**Order information**

Product	Pack size	Catalogue No.
Cellufine GCL-2000HF	100 mL	21400
	500 mL	21401
	5 L	21402
	10 L	21403

## Purchase / technical support

( North America and Europe)

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