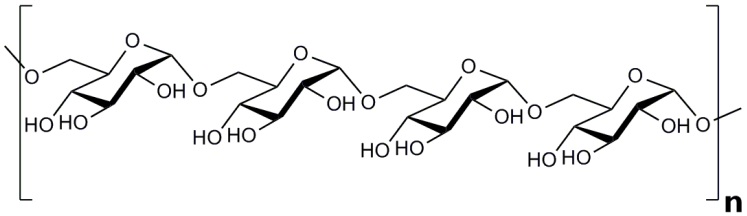
DEXTRAN (Lot 150401)

P-DEXT **02/16**
CAS: 9004-54-0

STRUCTURE:



Schematic representation of a dextran subunit composed by α-(1,6) linked glucose monosaccharides. (The degree of α-(1,3) branching is generally less than 5%)

PROPERTIES:

Purity:	> 94%
Molecular Weight (Mw):	64100 g/mol
Sugar composition:	Glucose 97.6%, Arabinose 1%, Other 1.25%
Protein:	0.16%
Moisture:	2.6%
Ash:	0.08%
Physical Description:	White powder

STORAGE CONDITIONS:

Store dry at room temperature in a well-sealed container. Under these conditions, the product is stable for several years.

WATER SOLUBILITY:

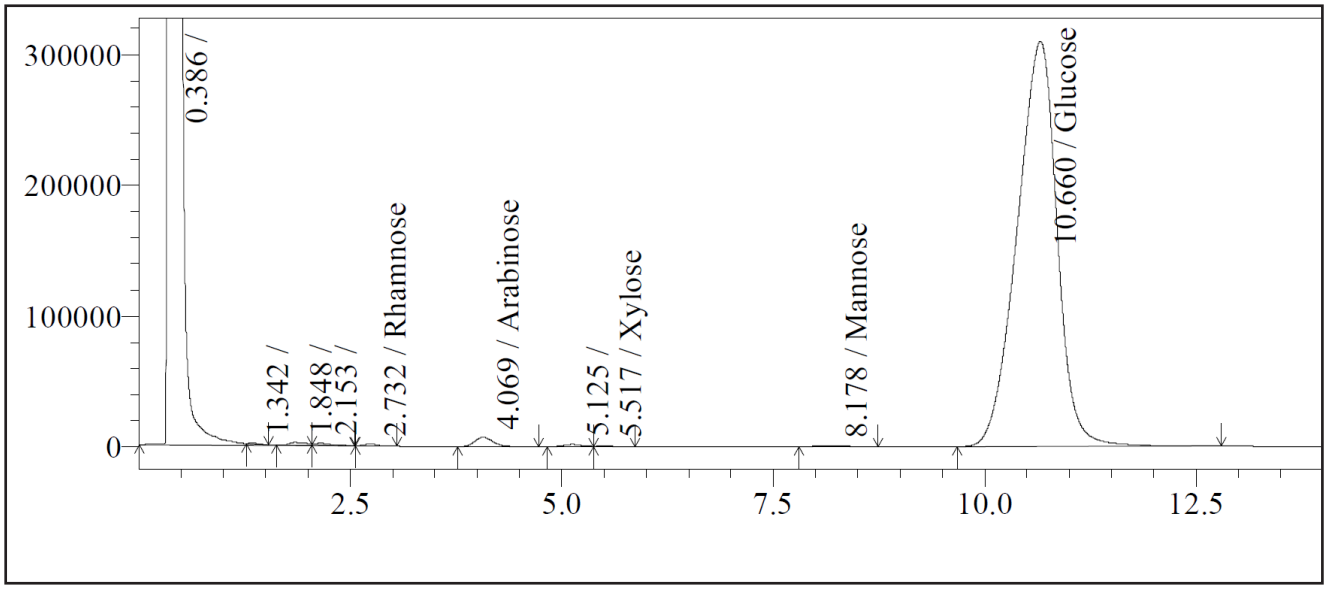
Readily soluble in water.

GLC ANALYSIS:

A typical polysaccharide sample (~ 10 mg) was hydrolysed using 2 N TFA at 120°C for 60 min. Subsequent sodium borohydride reduction was performed in 1 N NH_4OH for 90 minutes at 40°C. The corresponding alditol acetates were prepared using acetic anhydride and 1-methyl imidazole, extracted into CH_2Cl_2 and analysed by GC.

GLC system:	Shimadzu GC-14B with CHROMATOPAC C-R8A
Column:	Packed glass column (6 ft x 5 mm OD, 3 mm ID) with 3% Silar 10C on W-HP (80-100 mesh).
Column temperature:	230°C
Injector temperature:	250°C
Mobile phase:	Nitrogen gas
Flow rate:	130 KPa
Detector:	FID with 60 KPa H_2 pressure and 50 KPa air pressure

Gas liquid chromatography of the alditol acetates derived from hydrolysis and derivatisation of Dextran (Lot 150401)



Peak Results

Name	RT (min)	Area	% Area
Arabinose	4.069	109553	1.05
Glucose	10.66	10180178	97.69
Other		130708	1.25

GPC/SEC ANALYSIS

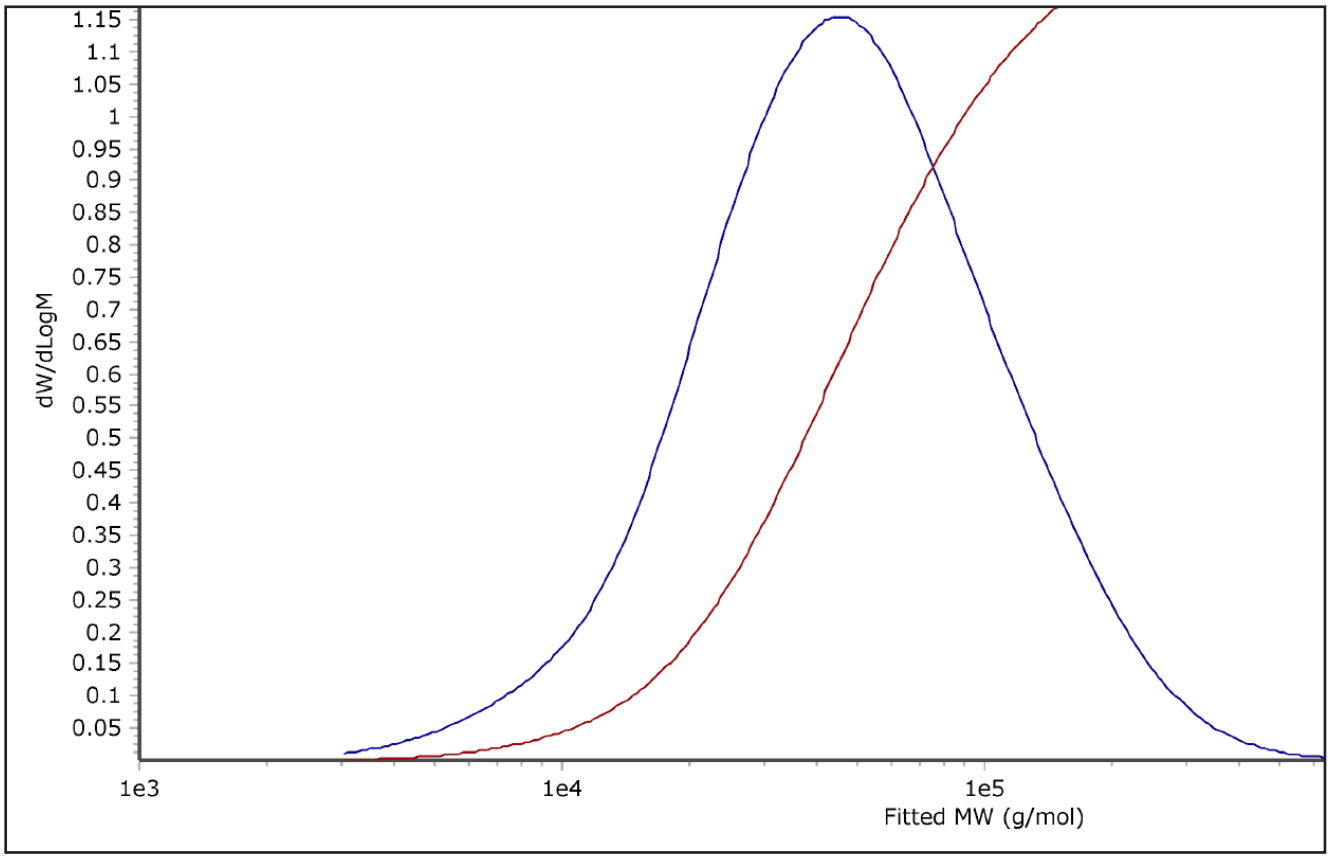
Polysaccharide Solubilisation Protocol

A few mg (2-6) of the polysaccharide were weighed into a glass test tube. Sufficient 0.1 M sodium nitrate containing 5 mM sodium azide (SEC eluent) was added to give a polysaccharide concentration of ~ 1 mg/mL. The samples were sealed and stirred for 2.5 h at 90°C. After cooling to RT, the solutions were filtered through a 0.22 µm filter and analysed. This protocol was repeated on two separate days.

Size Exclusion Chromatography

GPC/SEC chromatography was performed on a Agilent 1260 Infinity using a Shodex OHpak SB-806M HQ column (8 x 300 mm) followed by an Ultrahydrogel linear column (7.8 x 300 mm) maintained at 40°C using an eluent of 100 mM $NaNO_3$ containing 5 mM NaN_3 and flow rate of 0.6 mL/min. An Infinity 1260 Triple Detector Suite from Agilent Technologies was used, consisting of a RI detector, a viscometer detector and a dual angle (90° and 15°) laser light scattering detector. Triple detection analysis was done using the Agilent GPC/SEC software (Version A:02:01). A refractive index increment of 0.146 mL/g was used for the calculations.

Distribution Plot of Dextran (Lot 150401)



Results

The results of the analyses are provided in the table below. The average of three determinations is reported with the standard deviation (sd).

Polysaccharide & Lot Number	Mp	Mw	Mn	[η]	Rg	Pd
Dextran Lot 150401	45333	64100	33697	0.256251	7.655	1.9035
sd	327	548	821	0.002838	0.095	0.0625

The parameters measured are:

Mp – peak molecular weight (g/mol) – the molecular weight of the most abundant species in the sample.

Mw – weight average molecular weight – the average molecular weight of the distribution based on the weight of particles in each fraction.

Mn – number average molecular weight – the average molecular weight of the distribution based on number of particles in each fraction.

[η] – intrinsic viscosity (dL/g) – the contribution of solute molecules to solution viscosity.

Rg – radius of gyration (nm) – the root mean square distance of the monomers from the centre of the molecule.

Pd – Polydispersity Index – the ratio of Mw/Mn which is generally used as an indicator of the width of the distribution, with 1.0 representing monodisperse molecules.