



sucrosolutions™
FOR WATER

D.Nitro™ and D. Nitro UV™
Properties
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A business unit of



Introduction

D.Nitro™ is a non-toxic and non-hazardous nutritive carbohydrate that assists in the denitrification process in wastewater treatment plants. For this process to occur, the facultative heterotrophic bacteria that biologically reduce nitrate (NO₃) to nitrogen gas (N₂) require a carbon source to live. This carbon source is readily available in D.Nitro™ solutions.

The Sucrosolutions™ product range includes D.Nitro™ and D.Nitro UV™. D.Nitro UV™ is a very low colour variant designed for optimal operation with UV treatment of treatment plant discharge waters.

Definitions

Brix: The term °Brix (or °Bx) means the mass concentration of solids expressed as a percentage of the total mass of the solution. For example, 100 kg of 67°Bx sucrose in an aqueous solution contains 67 kg sucrose and 33 kg water.

Sucrose: Molecular formula: C₁₂H₂₂O₁₁.

General Properties

The general physical properties of D.Nitro™ products are:

Appearance:	Clear liquid, virtually colourless (D.Nitro UV™) Clear liquid, virtually colourless to pale yellow (D.Nitro™)			
Characteristic:	Free flowing at room temperature			
Density:	1.31 – 1.34 g/ml or kg/l @ 25°C			
pH Value:	6.0 – 8.0			
°Brix:	67			
Temperature:	10 – 70°C at delivery			
Colour (Apparent):	D.Nitro™	760 PtCo	D.Nitro UV™	85 PtCo
Turbidity:	D.Nitro™	5 NTU	D.Nitro UV™	5 NTU

Density

The density of D.Nitro™ varies with temperature and brix. Table 1 below gives densities for a mid-range brix of 67°Bx at different temperatures.

Table 1: Density of D.Nitro™ Products at the average 67°Brix

Temperature, °C	0	10	20	30	40	50	60	70
Density, kg/m ³ or g/l	1338	1334	1329	1324	1318	1312	1306	1300

Viscosity

D.Nitro™ solutions exhibit Newtonian behaviour. The dynamic viscosity of D.Nitro™ varies considerably according to temperature. Table 2 below gives viscosities for 67°Bx D.Nitro™ products at varying temperature (please note: this is the temperature of the actual product not the ambient conditions)

Table 2: Viscosity of D.Nitro™ Products at the average 67°Brix

Temperature, °C	0	10	20	30	40	50	60	70
Viscosity, cP	1355	514	229	115	63	38	24	16

Specific Heat

The specific heat of D.Nitro™ products at mid-range 67°Bx at 20°C is 2.60 kJ/(kg . K). The variation of specific heat with temperature may be considered negligible for most design purposes.

Thermal Conductivity

The thermal conductivity of D.Nitro™ products at mid-range 67°Bx at 20°C is 0.38 W/(m . K); and at 50°C is 0.41 W/(m . K).

Storage Conditions

D.Nitro™ solution can be subject to microbial deterioration, hence appropriate measures are required to minimise microbial contamination from the atmosphere.

Storage life depends on storage conditions and cleaning procedures. Recommended storage and handling conditions are similar to that for liquid sugars.

Exposure to cold temperatures for extended periods could lead to crystallization.

More information is available from the Sucrosolutions™ Sales Office.

Material Safety Data Sheet

Material Safety Data Sheets for D.Nitro™ products are available on the Sucrosolutions™ internet site or upon request - www.sucrosolutions.com.au.

Other Properties

Following are some general properties of a D.Nitro™ solution at 67°Bx. For data at other brixes or temperatures, please contact Sucrosolutions™ Sales Office on 1300 134 568.

BOD	0.61 kg/L
COD	1.0 kg/L
Freezing Point	-17°C
Boiling Point	104.2°C at atmospheric pressure
Diffusion Coefficient	39.0 (10 ⁻¹² m ² /s) at 20 C
Electrical Conductivity	Has been measured to be between 1 and 5 microSiemens/cm for D.Nitro UV™, and between 12 and 23 microSiemens/cm for D.Nitro™.
Kinematic Viscosity	171 (10 ⁻⁶ m ² /s) at 20 C
UV Transmittance	Has been measured to be 65% for D.Nitro UV™, and 60% for D.Nitro™ at 254nm wavelength.
Refractive Index	1.46 at 20°C and 589.3nm
Specific Enthalpy	51.1 kJ/kg at 20°C
Surface Tension	77.9 mN/m at 20°C
Vapour Pressure	2.01 kPa at 20°C

IMPORTANT INFORMATION

Disclaimer

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The Sucrosolutions™ business has technical personnel with a range of experience in the design and operation of bulk liquid sucrose handling systems. Before proceeding with a new system, or modifying an existing system, we suggest you contact the Sucrosolutions™ technical personnel to refer to their experience in assessing your needs.

All enquiries should be directed to the the Sucrosolutions™ Sales Office on 1300 134 568.

Occupational Health & Safety

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