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**Glucose-6-Phosphate
Dehydrogenase (G6P-DH)
from *Leuconostoc mesenteroides*
D-Glucose-6-phosphate:
NADP⁺ 1-oxidoreductase**

 **Version: 17**

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Cat. No. 10 165 875 001 1,000 U
 1 ml

Store the product at +2 to +8°C.

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1. General Information

1.1. Contents

Vial / bottle	Label	Function / description	Content
1	Glucose-6-Phosphate Dehydrogenase	Solution of 1,000 U in 1 ml 3.2 M ammonium sulfate, pH approximately 6.	1 vial, 1 ml

1.2. Storage and Stability

Storage Conditions (Product)

When stored at +2 to +8°C, the product is stable through the expiry date printed on the label.

Vial / bottle	Label	Storage
1	Glucose-6-Phosphate Dehydrogenase	Store at +2 to +8°C.

1.3. Additional Equipment and Reagent required

For reaction

- Glucose-6-phosphate

1.4. Application

Glucose-6-Phosphate Dehydrogenase is a component of cofactor recycling systems for NADPH.

2. How to Use this Product

2.1. Before you Begin

General Considerations

Enzyme characteristics

- Equilibrium constant: The oxidation (forward) reaction is strongly favored.
- Turnover number: 3.2×10^4 mol substrate/mol enzyme/minute (NADP as coenzyme).

Additional information

- Myristic acid, dehydroepiandrosterone, and palmitoyl CoA do not inhibit LG6P-DH as they do G6P-DH from yeast.
- LG6P-DH uses either NAD or NADP. Yeast G6P-DH uses NADP only as cofactor.
- To achieve pseudo first order kinetics with respect to glucose with LG6P-DH, add approximately 17 mM ATP to raise the apparent K_m of the enzyme for glucose. This allows use of LG6P-DH in a kinetic assay for glucose.

2.2. Parameters

Absorbance

Absorbance of purified enzyme: 1.15 (1 mg enzyme/ml, 280.5 nm).

Activator

HCO_3^- (≤ 0.3 M) activates slightly.

Contaminants

<0.001% CK
<0.01% GR and PGI, each
<0.02% NADH oxidase
<0.05% HK
<0.001% 6-PGDH

EC-Number

EC 1.1.1.49

Inhibition

Phosphate ($K_i = 50$ mM), pyridoxal-5'-phosphate ($K_i = 0.04$ to 0.06 mM), acetyl-CoA, CoA. NADPH inhibits the NAD-dependent reaction. ATP inhibits the reaction with either NAD or NADP.

i Mg^{2+} reverses inhibition by ATP.

Isoelectric Point

4.6

Molecular Weight

110 kDa (dimer)

pH Optimum

7.0 to 8.5, maximum activity at 7.8.

Specific Activity

550 U/mg at +25°C (650 U/mg at +30°C) with glucose-6-phosphate and NAD as the substrates.

Specificity

At pH 7.8, +25°C:

- G6P-DH from *Leuconostoc* (LG6P-DH) is highly specific for D-glucose-6-phosphate ($K_m = 36 \mu\text{M}$, NADP as coenzyme; $64 \mu\text{M}$, NAD as coenzyme), but will use either NADP ($K_m = 7.4 \mu\text{M}$; relative rate = 1.0) or NAD ($K_m = 115 \mu\text{M}$; relative rate = 1.8) as coenzyme.
- LG6P-DH does not react with fructose-6-phosphate, fructose-1,6-biphosphate, glucose-1-phosphate, or ribose-1-phosphate.
- LG6P-DG will oxidize 2-deoxy-glucose-6-phosphate with NADP, but not with NAD as coenzyme.
- There is a slow reaction with D-glucose.

Unit Conversion

One unit (+25°C) \approx 1.18 U (+30°C) \approx 1.45 U (+37°C), all with NAD as coenzyme.

Unit Definition

One unit LG6P-DH oxidizes 1 μmol of glucose-6-phosphate and reduces 1 μmol of NAD^+ in 1 minute at +25°C and pH 7.8.

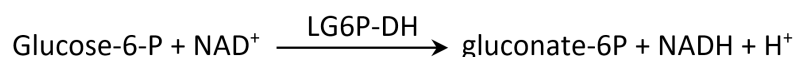
Volume Activity

1 U/ μl

3. Additional Information on this Product

3.1. Test Principle









Reaction mechanism



4. Supplementary Information

4.1. Conventions

To make information consistent and easier to read, the following text conventions and symbols are used in this document to highlight important information:

Text convention and symbols	
 <i>Information Note: Additional information about the current topic or procedure.</i>	
 Important Note: Information critical to the success of the current procedure or use of the product.	
   etc.	Stages in a process that usually occur in the order listed.
   etc.	Steps in a procedure that must be performed in the order listed.
* (Asterisk)	The Asterisk denotes a product available from Roche Diagnostics.

4.2. Changes to previous version

Layout changes.
Editorial changes.

4.3. Trademarks

All product names and trademarks are the property of their respective owners.

4.4. License Disclaimer

For patent license limitations for individual products please refer to:
List of biochemical reagent products.

4.5. Regulatory Disclaimer

For life science research only. Not for use in diagnostic procedures.

4.6. Safety Data Sheet

Please follow the instructions in the Safety Data Sheet (SDS).

4.7. Contact and Support

To ask questions, solve problems, suggest enhancements or report new applications, please visit our **Online Technical Support Site.**

To call, write, fax, or email us, visit **sigma-aldrich.com**, and select your home country. Country-specific contact information will be displayed.

