diatron

HbA1c

Specifically for use with Diatron PICTUS® 700 and PICTUS® 500 Analyzers

REF **1419-1053** **Packaging:** 2 x 22 mL (R1) + 2 x 7.3 mL (R2)

Total Hemoglobin: 2 x 22 mL

Denaturant: 2 x 60 mL

2°C 8°C

Σ 200

INTENDED USE

Reagent kit for In Vitro automated quantitative measurement by trained laboratory professionals of the concentration of HbA1c in samples of whole blood, from patients suspected for or diagnosed with diabetes. Measurements of HbA1c are intended to be used by licensed physicians, along with other in vitro and in vivo tests and physical examination, as an aid in the diagnosis of carbohydrate metabolism disorders such as diabetes and in monitoring of long-term glycemic control.
This reagent is formulated specifically for use with Diatron Pictus® P700 and P500 analyzers.
For in vitro diagnostic use only by trained laboratory professionals.

CLINICAL SIGNIFICANCE

HbA1c is a subfraction of glycated hemoglobin, normally produced by the post-transcriptional, non-enzymatic, irreversible attachment of a hexose adduct in the N-terminus valine of the β-chain of hemoglobin. The HbA1c formation rate in erythrocytes is proportional to the blood glucose concentration and is further dependent on the time of exposure of erythrocytes to glucose. Given that the reaction is irreversible, and the average red blood cell life is approximately 120 days, HbA1c reflects to the mean blood glucose levels during the previous 2 to 3 months. In clinical practice HbA1c is used as a biochemical index for the diagnosis of conditions related to carbohydrate metabolism and for monitoring of long-term glycemic control.

METHOD PRINCIPLE

Hemoglobin A1c uses an enzymatic method that measures specific N-terminal fructosyl dipeptides of the β-chain of HbA1c. During pretreatment, erythrocytes are lysed and hemoglobin is converted to methemoglobin by reaction with sodium nitrite. By adding reagent R1, the glycosylated N-amino-terminal dipeptide (fructosyl-VH) of the hemoglobin β-chain is cleaved by protease action. Hemoglobin is converted to stable methemoglobin azide by the action of sodium azide, and the hemoglobin concentration is determined by measuring absorbance. Adding reagent R2 initiates a reaction and fructosyl peptide amylase (FPOX) can react with fructosyl-VH. The HbA1c concentration is measured by determining the hydrogen peroxide produced.
Total hemoglobin (THb): Hemoglobin is oxidized to a stable methaemoglobin azide by the action of sodium nitrate and sodium azide and the hemoglobin concentration is determined by measuring absorbance.
The percentage of total Hb existing as HbA1c is automatically calculated by the analyzer from the concentrations of HbA1c and Hb, according to the following formulas:

- HbA1c (mmol/mol) IFCC ratio = (HbA1c/THb) × 1000, and
- HbA1c (%) DCCT/NGSP = IFCC x 0,09148 + 2,152

METHOD LIMITATIONS

When the sample contains HbF >5%, incorrectly reduced HbA1c results may occur.
Refer to the book "Effects of Preanalytical Variables on Clinical Laboratory Tests" for possible interference of other pharmaceutical agents in this particular test. Interference of other agents is described in the "Clinical Guide to Laboratory Tests". This reagent is formulated specifically for use with Diatron Pictus® P700 and P500 analyzers. For additional information please contact customer support at Diatron or Medicon.

REAGENT COMPOSITION

R1	Protease	<2 MU/dL
	10-(Carboxymethylaminocarbonyl)-3,7-bis(dimethylamino)-phenothiazine, sodium salt	<0.01%
	Stabilizers and preservatives	
R2	Peroxidase	<10 kU/dL
	Stabilizers and preservatives	
Denaturant	Sodium nitrite	< 0.5%
	Stabilizers and preservatives	

⚠ **WARNINGS – PRECAUTIONS**

- The reagent is designed for in vitro diagnostic use. In vitro diagnostic reagents can be hazardous. They should be handled according to good laboratory techniques. Avoid inhalation and contact with eyes, skin, and mucus membranes.
- Samples should be considered as potentially infectious. Handle with special caution.
- This reagent contains Ethanol. Ensure good ventilation of the work station. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Take all necessary technical measures to avoid or minimize the release of the product on the workplace. Limit quantities of product at the minimum necessary for handling and limit the number of exposed workers. Provide local exhaust or general room ventilation. Wear personal protective equipment. Floors, walls and other surfaces in the hazard area must be cleaned regularly.
- Use of reagent components from different lots must be strictly avoided
- Discard both R1 and R2 vials when either one is consumed
- Never refill empty or half-empty vials; this will cause fast deterioration of freshly added reagent to the old one.
- Dispose all waste according to national laws.
- SDS is available by MEDICON.
- Any serious incident that may occur in relation to this device must be reported by the user to the manufacturer and the competent authority of the country in which the user and/or the patient is established.

⚠ **PREPARATION**

Total Hemoglobin Reagent (R1), HbA1c Reagents R1 and R2, and Denaturant are ready to use and can be placed on the apparatus. Invert HbA1c R1 gently before first use. The vials bear barcodes for automatic recognition by Diatron Pictus® P700 / P500 analyzers.

⚠ **REAGENT DETERIORATION**

The reagents should not be used:

- When they do not exhibit the specified linearity or control values lie outside the acceptable range after recalibration.
- After prolonged exposure to sunlight or high temperature.

⚠ **SHELF LIFE**

Unopened, reagents are stable at 2 – 8°C up to the expiry date stated on the label, stored away from direct light and vibrations. Once opened, R1, R2, and Total Hemoglobin (R1) remain stable for at least 28 days when loaded on the cooled analyzer tray.

⚠ **SAMPLE** Specimens of EDTA whole blood must be used. Use established Good Laboratory Practices for sampling, transport and separation from blood cells. Do not use hemolyzed, contaminated or turbid sample specimens. The sample is processed automatically by the analyzer. Shake the sample gently to homogenize before placing in the analyzer. Samples (not pretreated) are stable for up to 1 week when stored at 25°C, 2 weeks when stored at 2 – 8°C and up to 6 months when frozen to ≤-70°C. (Tietz, 1995)

CALIBRATION Diatron offers MEDICON HbA1c calibrator (code: 1578-1053). Gently invert each vial several times before use to ensure homogenous mix.
Calibrate the assay for every new reagent lot. Recalibrate the assay every 28 days. Calibration should be repeated after major maintenance is performed on the analyzer or a critical part is replaced or a significant shift in control values occurs.

QUALITY CONTROL Diatron offers the MEDICON HbA1c Control (code: 1578-1057) for quality control. Control recovery should lie within the acceptable range. Control recovery should lie within the acceptable range. Results outside the acceptable range even after recalibration could be due to reagent deterioration, unsuitable storage conditions or control deterioration, instrument malfunction, or error during test procedure.

MATERIALS REQUIRED BUT NOT PROVIDED WITH THE KIT

Diatron Pictus® analyzer
HbA1c calibrator
Quality control material
Common laboratory equipment

REFERENCE INTERVALS

Non-diabetics: 4.0 – 6.2%
For glycemic control of diabetics: < 7%
Patients with HbA1c values in the range of 5.7 - 6.4 %HbA1c (39 - 46 mmol/mol) may be at a risk of developing diabetes.
Expected values may vary with age, sex, sample type, diet and geographical location. Reference values are based on current bibliography. Each laboratory should determine its own expected values as dictated by good laboratory practices, according to its patient population.

⚠ **WASTE DISPOSAL**

Dispose of contents/container in accordance with licensed collector's sorting instructions.

SPECIFIC PERFORMANCE CHARACTERISTICS

The following values are representative of the reagent performance on Diatron Pictus® P700 or P500 analyzers.The reagent performance has been evaluated on other types of analyzers, covering all requirements of the 98/79 IVD Directive. The results taken in your laboratory may differ from these values.
Linearity: **HbA1c:** 2.6% – 18%
The measuring range is the concentration interval between LoQ and upper limit of linearity. When values exceed this range, samples should be diluted accordingly.
Lowest Detection Limit: **HbA1c:** 7.69 mmol/L **THb:** 8.69 mmol/L
The limit of detection (LoD) is defined as the lowest concentration which can be measured with acceptable precision. The LoD was determined using a method in accordance with the CLSI EP17-A procedure.
These are the results of an observational study only, with no specific acceptance criteria. However, it is reasonable to expect that the LoD will be similar to the lowest linearity limit for each assay method and sample type tested.
Precision: Within-run studies are performed at 3 different concentration levels (low, mid and high levels) using 20 repeats per level. The reproducibility of the reagent is assessed as total precision following CLSI EP05-A3 guidelines on serum specimens. Within-run %CV should be lower than 5% in all levels tested for all lots. Total precision %CV should be lower than 8% in all levels tested for all lots.

Level (%)	**%CV**
5.5	1.27
6.2	1.73
9.1	1.65
Level (%)	**Total %CV**
5.4	3.18
9.7	2.29
13.7	2.96

INTERFERENCES - Criterion: recovery within ±10% from target value

	(Insignificant up to)
Triglycerides	3000 mg/dL
Unconjugated bilirubin	20 mg/dL
Conjugated bilirubin	20 mg/dL
Urea	1000 mg/dL
Ascorbic Acid	3 mg/dL

CE IVD

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General Electronic Commercial Registry (G.E.MI.) No. 414401000

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⚠ **LABEL ELEMENTS**

Precautionary statements (CLP)	Hazard statements (CLP)
P201 - Obtain special instructions before use. **P280** - Wear protective gloves/protective clothing/eye protection/face protection/hearing protection. **P308+P313** - IF exposed or concerned: Get medical advice/attention.	**H350** - May cause cancer.  - Warning GHS08

SYMBOLS

 Manufacturer

 Temperature Limit

 Caution

IVD *In vitro* diagnostic medical device

REF Catalogue Number

Contains sufficient for <n> tests

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