DxDATA™

Version 1.0

Total Thyroxine (T4) CLIA Kit

Magnetic particle chemiluminescence method

Instructions for Use

REF DXDA-1029-10

REF DXDA-1029-40

Σ 10 Σ 40

DRG Instruments GmbH
Frauenbergstrasse 18
35039 Marburg
Germany

Technical Support
USA Phone: +1-973-564-7555
USA Fax: +1-973-564-7556
Email: drgsupport@drg-international.com

International Phone: +49(0)6421/1700-0
International Fax: +49(0)6421/1700-50
Email: drg@drg-diagnostics.de

IVD CE

FOR PROFESSIONAL USE ONLY

Please use only the valid version of the Instructions for Use provided with the kit.
Verwenden Sie nur die jeweils gültige, im Testkit enthaltene, Gebrauchsanweisung.
Si prega di usare la versione valida delle istruzioni per l'uso a disposizione con il kit.
Por favor, use sólo la versión válida de las instrucciones de uso que se suministran con el kit.
Utilisez seulement la version valide des Instructions d'utilisation fournies avec le kit.
Utilize apenas a versão válida das Instruções de Utilização fornecidas com o kit.
Należy używać wyłącznie aktualnej wersji Instrukcji użytkowania dostarczonej z zestawem.

Introduced modifications / Durchgeführte Änderungen / Modifiche introdotte / Modificaciones introducidas / Modifications apportées / Modificações introduzidas / Wprowadzone modyfikacje
The following changes have been made in comparison to the previous version: Im Vergleich zur Vorgängerversion wurden folgende Änderungen vorgenommen: Rispetto alla versione precedente, sono state apportate le seguenti modifiche: Se han introducido los siguientes cambios en comparación con la versión anterior: Les modifications suivantes ont été apportées par rapport à la version précédente : Foram efetuadas as seguintes alterações em comparação com a versão anterior: W porównaniu z poprzednią wersją wprowadzono następujące zmiany:
Creation of document

Table of Contents

Symbols List

The following symbols may appear on the product labels or instructions for use.

Symbol	Description
	In Vitro Diagnostic Medical Device
	Lot Number
	Caution
	European Conformity
	Temperature Limit
	Consult Instructions for Use
	Biological hazard

Symbol	Description
	Catalog Number
	Contains Sufficient for <*n*> Tests
	Use-By Date
	Date of Manufacture
	Manufacturer
	Keep away from heat or direct sun light.

1. Intended Use

This kit is used to quantitatively determine the content of Total Thyroxine (TT4) in human serum or plasma (sodium heparin, K2 EDTA) samples in vitro.

The test results of the kit are not the only confirmatory indicators in the clinic, and their clinical significance needs to be analyzed in combination with other test indicators and patient's clinical history.

2. Summary and Principles of the Procedure

Summary

Thyroid dysfunction can cause excess (hyperthyroidism) or insufficient (hypothyroidism) of total thyroxine (TT4) and triiodothyronine (T4). Thyroid function is directly affected by thyroid stimulating hormone (TSH). If the pituitary gland or hypothalamus is dysfunctional, it will also affect the thyroid function. Therefore, total thyroxine (TT4), triiodothyronine (T4) and thyroid-stimulating hormone (TSH) are closely related, and these indicators are also analyzed together in clinical practice. Clinically, it is mainly used to assist in the evaluation of thyroid function.

Principle of the test

The competition method is used in this kit to determine the content of TT4.
The sample, biotinylated T4 antibody (containing dissociation agent) and excess streptavidin-labeled magnetic beads are added to the reaction well and incubated to form two complexes, magnetic beads-streptavidin-biotin-T4 antibody-T4 antigen and magnetic beads-streptavidin-biotin-T4 antibody. Then alkaline phosphatase-labeled T4 antigen is added to the reaction well and incubate to make the enzyme-labeled T4 antigen compete to bind to the vacant sites of the T4 antibody to form magnetic beads-streptavidin-biotin-T4 antibody-enzyme-labeled T4 antigen complex. After washing, the luminescent substrate is added, and the luminescent substrate is catalyzed by the enzyme in the complex to form unstable excited state intermediates. When the excited intermediates return to the ground state, photons are emitted. The number of photons produced is negatively correlated with the concentration of TT4 in the sample

3. Warnings and Precautions

1. This kit is for *in vitro* diagnostic use only.
2. For laboratory professional use only.
3. This kit can only be used in combination with the DxDATA™ Automated Chemiluminescent Immunoassay Analyzing System.
4. Before starting the assay, read the instructions for use completely and carefully. Use the valid version of the instructions for use provided with the kit. Be sure that everything is understood.
5. **Do not remove, exchange, discard, or damage any of the barcode labels provided with each kit and its components.**

6. **All barcodes build an integral system for the kit lot.**
7. Do not mix or use components from kits with different lot numbers. It is advised not to interchange reagent cartridges of different kits even of the same lot. The kits may have been shipped or stored under different conditions and the binding characteristics of the wells in the reagent cartridges may differ slightly.
8. Do not use reagents beyond expiry date as shown on the kit labels.
9. Reagents of other manufacturers must not be used together with the reagents of this test kit.
10. Test cartridges are recommended to be used immediately upon unpacking.
11. Test results are indicated for using as an adjunct to standard clinical practice, diagnosis should be based on integrated information of symptoms, physical conditions, medical history, other clinical tests and response to treatment.
12. Microbial contamination of reagents or samples may give false results.

General precautions

1. Follow good laboratory practice and safety guidelines.
2. Never pipet by mouth and avoid contact of reagents and samples with skin and mucous membranes.
3. Do not smoke, eat, drink, or apply cosmetics in areas where samples or kit reagents are handled.
4. Wear lab coats and disposable latex gloves when handling samples and reagents and where necessary safety glasses.

Biohazard information

1. All reagents of this test kit which contain human serum or plasma have been tested and confirmed negative for HIV I/II, HBsAg and HCV by FDA approved procedures. However, no known test method can offer total assurance that no infectious agent is present.
2. Bovine components originate from countries where BSE (Bovine spongiform encephalopathy) has not been reported.
3. All materials and samples of human or animal origin must be handled as if capable of transmitting infectious diseases.
4. Handling must be done in accordance with the procedures defined by appropriate national biohazard and safety guideline or regulation. Waste must be discarded according to local rules and regulations.

Information to chemical hazards and hazard classification

1. Some reagents contain preservatives in non-declarable concentrations. Nevertheless, in case of contact with eyes or skin, flush immediately with water.
2. Chemicals and prepared or used reagents have to be treated as hazardous waste according to the national safety guidelines or regulations.
3. This product does not contain substances which have carcinogenic, mutagenic, or toxic for reproduction (CMR) properties.

Some kit components are classified as hazardous.

Hazardous ingredient: Mixture of 5-Chloro-2-methyl-4-isothiazolin-3-one and 2-Methyl-2H-isothiazol-3-one (3:1) included in ProClin 300 (refer to section 4)

 **Warning**	**Hazard statement(s):** H317 May cause an allergic skin reaction.
	Precautionary statement(s): P261 Avoid breathing dust/fume/gas/mist/vapours/ spray. P272 Contaminated work clothing should not be allowed out of the workplace. P280 Wear protective gloves/protective clothing/eye protection/face protection. P302 + P352 IF ON SKIN: Wash with plenty of water. P333 + P313 If skin irritation or rash occurs: Get medical advice/attention. P362 + P364 Take off contaminated clothing and wash it before reuse.

For detailed information, please refer to the Safety Data Sheet, which is available upon request directly from DRG.

4. Materials Provided

4.1. Kit Components

Table 4-1

Kit Components	Quantity		Description
Cartridge	10 tests	40 tests	See Table 4-2.
QC 1	200 µL×1	200 µL×2	Human T4 antigen, containing 0.1 % ProClin 300 in Tris buffer. The quality control range was [30.24, 68.86] ng/mL.
QC 2	200 µL×1	200 µL×2	Human T4 antigen, containing 0.1 % ProClin 300 in Tris buffer. The quality control range was [103.67, 197.24] ng/mL.
Calibrator 1	200 µL×1	200 µL×2	Human T4 antigen, containing 0.1 % ProClin 300 in Tris buffer. Target concentration: 20 ng/mL.
Calibrator 2	200 µL×1	200 µL×2	Human T4 antigen, containing 0.1 % ProClin 300 in Tris buffer. Target concentration: 200 ng/mL.

4.2. Components of the Test Cartridge

Table 4-2: Components of the Test Cartridge

Components	Quantity	Main Composition
Washing buffer	2.0 mL	0.095 % Tween-20, 0.017 % ProClin 300 in Tris buffer
Luminescent substrate	180 µL	APCL-1 substrate
Antibody reagent	80 µL	Biotinylated mouse anti-human T4 monoclonal antibody, 0.1 % Proclin 300 in Tris buffer
Enzyme reagent	80 µL	T4 antigen containing alkaline phosphatase, 0.1 % ProClin 300 in Tris buffer
Magnetic separation reagent	60 µL	Streptavidin labeled magnetic beads in PBS buffer
Pipette tip	1	/
Eluting sleeve	1	/
Reading aperture	1	/

5. Materials Required but Not Provided

1. General needed laboratory equipment
2. DxDATA™ Automated Chemiluminescent Immunoassay System
3. Micropipette and tips for sample addition
4. Sample collection materials and centrifuge

6. Reagent Storage, Handling and Stability

1. All kit components must be handled and stored as described below.

Unopened and unused components or kits

	Storage Temperature	Stability
– Unopened kits – Unopened reagents – Unused cartridges	2 °C to 8 °C	Until the expiration date printed on the label. Do not use reagents beyond this date!

2. Protect from light until ready for use.
3. Keep upright for storage.
4. Quality controls and calibrators are stable after unpacking when stored at 2 °C - 8 °C until the expiration date printed on the label.

7. Sample Requirements

The device shall be performed on human serum or plasma (sodium heparin, K2 EDTA) samples. After blood collection, the test should be completed within 4 hours at room temperature. If it cannot be tested in time, the sample could be stored at 2~8°C for 24 hours. For long-term storage, please place small aliquots below -20 °C to avoid repeated freeze-thaw and can be stored for 3 months. The refrigerated samples must be restored to room temperature before use.

Attention:

1. This test was not verified with blood collection tubes of all available manufacturers.
2. Sample collection systems of some manufacturers may contain different materials which in isolated cases could affect the test results.
3. In general, it should be avoided to use hemolytic, icteric, or lipemic samples.
4. Samples containing precipitates have to be centrifuged prior to the test run.
5. Do not use heat inactivated samples.
6. Samples or external controls containing sodium azide should not be used in the assay.

8. Quality Control

It is recommended to use control samples according to state and federal regulations. The use of control samples is advised to assure the day-to-day validity of results.
If available, it is also recommended to participate in national or international Quality Assessment programs in order to ensure the accuracy of the results.
Apply appropriate statistical methods for analyzing control values and trends. If the results of the assay do not agree with the established acceptable ranges of control materials, patient results should be considered invalid. In this case, please check the following: expiration dates and storage conditions of reagents, operational reliability of the analyzer. In addition, it is indicated to perform a Recalibration. After checking the above-mentioned items without finding any error contact your distributor or DRG directly.

Calibration:

1. Scan the QR code on the reagent kit by external scanner in order to access the working calibration curve information for this lot. Add 80 µL Calibrator 1, Calibrator 2 to the Cartridge sample well.
2. The recommended calibration period is 28 days, which can be adjusted according to different test frequencies in each lab. Re-calibration is necessary when a different lot is used, fluctuation of control reading occurs after system maintenance or key part replacement.
3. For specific operation steps, please refer to the DxDATA™ Automated Chemiluminescent Immunoassay Analyzing System User Manual.

Quality Control (QC) testing:

1. Add 80 µL QC1 and QC2 to the Cartridge sample well.
2. To ensure the stability of the testing system, quality control testing should be performed every day. If the quality control result is in control, sample testing can be carried out; if the quality control result is out of control, the reasons should be figured out, such as the status or parameter settings of the instrument, reagent or quality control products.
3. For specific operation steps, please refer to the DxDATA™ Automated Chemiluminescent Immunoassay Analyzing System User Manual.

9. Test Procedure

1. Unpack the kit and equilibrate all materials and samples to room temperature before use.
2. Insert the test cartridge to the reagent rack. Add 80 µL sample vertically into the sample well, and place into the DxDATA™ Automated Chemiluminescent Immunoassay Analyzing System.
3. To ensure proper test performance, strictly adhere to the DxDATA™ Automated Chemiluminescent Immunoassay Analyzing System User Manual

10. Interpretation of Results

Reference range

1. A total of 442 normal healthy human samples were used to set the reference interval. The reference interval of normal value: 60.50-122.90ng/mL.
2. The so-called normal people here specifically refer to homogeneous people who have not been clinically diagnosed with related diseases. Due to geographical, population age and racial factors, labs using this kit should establish their own normal reference range. Results from this test should not be used as the sole basis to diagnose but used in conjunction with other tests and clinical symptoms analysis to aid in the evaluation of patients.

Explanation of Results

1. The reportable concentration range for this kit is [8,300] ng/mL. Beyond the range, test results will be reported as＜8ng/mL or ＞300ng/mL.
2. When the concentration of the sample exceeds the upper limit of detection, if necessary, the high-concentration sample can be diluted by no more than 5 times with saline solution and then tested. The test result is multiplied by the dilution times to obtain the original concentration of the sample.

11. Limitations of the Procedure

1. This product shall be used on the DxDATA™ Automated Chemiluminescent Immunoassay Analyzing System only.
2. Reliable and reproducible results will be obtained, when the assay procedure is performed with a complete understanding of the instructions for use and with adherence to good laboratory practice.
3. Any improper handling of samples or modification of this test might influence the results.

12. Performance Characteristics

1. Accuracy: The ratio of the actual measured value to the theoretical value should be between 0.850 and 1.150 when testing the national standard within the measurement range specified by the kit.
2. Blank limit: should not be higher than 5 ng/mL.
3. Linearity: Within the linear range of [8,300] ng/mL, the absolute value of correlation coefficient (|r|) should be ≥0.9900.
4. Precision:
    1. Intra-lot precision: Test the quality control 1 and 2 for 8 times as samples. The CV should be ≤ 8%.
    2. Inter-lot precision: Test the quality control 1 and 2 of three kit lots 8 times. The inter-lot coefficient of variation (CV) between the three kit lots should not be higher than 20%.
5. Measured value of quality controls: The measurement results of the same quality controls should be within the range specified in this kit.
6. Specificity:
    1. For TT3 with a concentration ≥500 ng/mL, the test result on this kit should not be higher than 15.0ng/mL.
    2. For rT3 with a concentration ≥50ng/mL, the test result on this kit should not be higher than 15.0 ng/mL.

13. Legal Aspects

13.1 Reliability of Results

The test must be performed exactly as per the manufacturer's instructions for use. Moreover, the user must strictly adhere to the rules of GLP (Good Laboratory Practice) or other applicable national standards and/or laws. This is especially relevant for the use of control reagents. It is important to always include, within the test procedure, a sufficient number of controls for validating the accuracy and precision of the test.
The test results are valid only if all controls are within the specified ranges and if all other test parameters are also within the given assay specifications. If there is any doubt or concern regarding a result, please contact DRG.

13.2 Therapeutic Consequences

Therapeutic consequences should never be based on laboratory results alone even if all test results are in agreement with the items as stated under point 12.1. Any laboratory result is only a part of the total clinical picture of a patient.
Only in cases where the laboratory results are in acceptable agreement with the overall clinical picture of the patient should therapeutic consequences be derived.
The test result itself should never be the sole determinant for deriving any therapeutic consequences.

13.3 Liability

Any modification of the test kit and/or exchange or mixture of any components of different kit lots could negatively affect the intended results and validity of the overall test. Such modification and/or exchanges invalidate any claim for replacement.
Claims submitted due to customer misinterpretation of laboratory results subject to point 12.2 are also invalid. Regardless, in the event of any claim, the manufacturer's liability is not to exceed the value of the test kit. Any damage caused to the test kit during transportation is not subject to the liability of the manufacturer.