DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Food and Drug Administration
2098 Gaither Road
Rockville MD 20850

Edward M. Levine, Ph.D.
Director of Clinical Affairs
Diagnostic Products Corporation
5700 West 96th Street
Los Angeles, CA 90045-5597

JUL 25 1997

Re: K971792
IMMULITE® Free T4 (2-Step)
Regulatory Class: II
Product Code: CEC
Dated: May 14, 1997
Received: May 15, 1997

Dear Dr. Levine:

We have reviewed your Section 510(k) notification of intent to market the device referenced above and we have determined the device is substantially equivalent (for the indications for use stated in the enclosure) to devices marketed in interstate commerce prior to May 28, 1976, the enactment date of the Medical Device Amendments or to devices that have been reclassified in accordance with the provisions of the Federal Food, Drug, and Cosmetic Act (Act). You may, therefore, market the device, subject to the general controls provisions of the Act. The general controls provisions of the Act include requirements for annual registration, listing of devices, good manufacturing practice, labeling, and prohibitions against misbranding and adulteration.

If your device is classified (see above) into either class II (Special Controls) or class III (Premarket Approval), it may be subject to such additional controls. Existing major regulations affecting your device can be found in the Code of Federal Regulations, Title 21, Parts 800 to 895. A substantially equivalent determination assumes compliance with the current Good Manufacturing Practice requirement, as set forth in the Quality System Regulation (QS) for Medical Devices: General regulation (21 CFR Part 820) and that, through periodic (QS) inspections, the Food and Drug Administration (FDA) will verify such assumptions. Failure to comply with the GMP regulation may result in regulatory action. In addition, FDA may publish further announcements concerning your device in the Federal Register. Please note: this response to your premarket notification submission does not affect any obligation you might have under sections 531 through 542 of the Act for devices under the Electronic Product Radiation Control provisions, or other Federal Laws or Regulations.

Under the Clinical Laboratory Improvement Amendments of 1988 (CLIA-88), this device may require a CLIA complexity categorization. To determine if it does, you should contact the Centers for Disease Control and Prevention (CDC) at (770) 488-7655.

This letter will allow you to begin marketing your device as described in your 510(k) premarket notification. The FDA finding of substantial equivalence of your device to a legally marketed predicate device results in a classification for your device and thus, permits your device to proceed to the market.

If you desire specific advice for your device on our labeling regulation (21 CFR Part 801 and additionally 809.10 for in vitro diagnostic devices), please contact the Office of Compliance at (301) 594-4588. Additionally, for questions on the promotion and advertising of your device, please contact the Office of Compliance at (301) 594-4639. Also, please note the regulation entitled, "Misbranding by reference to premarket notification" (21 CFR 807.97). Other general information on your responsibilities under the Act may be obtained from the Division of Small Manufacturers Assistance at its toll-free number (800) 638-2041 or (301) 443-6597 or at its internet address "http://www.fda.gov/cdrh/dsmamain.html".

Sincerely yours,

Steven Gutman

Steven I. Gutman, M.D., M.B.A.
Director
Division of Clinical
Laboratory Devices
Office of Device Evaluation
Center for Devices and
Radiological Health

Enclosure

JUL 25 1997

K971792

510 (k) Summary
Safety and Effectiveness

This summary of safety and effectiveness information has been prepared in accordance with the requirements of SMDA 1990 and 21 CFR Part 807.92.

Name: **Address:**	Diagnostic Products Corporation 5700 West 96th Street Los Angeles, California 90045-5597
Telephone Number: **Facsimile Number:**	(213) 776-0180 (213) 776-0204
Contact Person:	Edward M. Levine, Ph.D. Director of Clinical Affairs
Date of Preparation:	May 14, 1997
Device Name **Trade:** **Common:**	 IMMULITE® Free T4 (2-Step) Reagent system for the determination of free T4 in serum
Catalog Number:	LKFT1 (100 tests), LKFT5 (500 tests)
Classification: **CLIA Complexity Category:**	Class II device, 75-CEC (862.1695) Moderate, based on previous classification of analogous tests.
Manufacturer:	Diagnostic Products Corporation 5700 West 96th Street Los Angeles, California 90045-5597
Establishment Registration Number:	DPC's Registration Number is 2017183
Substantially Equivalent Predicate Device:	DPC's Coat-A-Count® Free T4 (K822882)
Description of Device:	IMMULITE® Free T4 (2-Step) is a solid-phase, Chemiluminescent enzyme immunoassay for use with the IMMULITE® Automated Immunoassay Analyzer.
Intended Use of the Device:	The IMMULITE® Free T4 (2-Step) assay is designed for the quantitative measurement of non-protein-bound thyroxine (free T4) levels in serum. It is intended strictly for *in vitro* use as an aid in the clinical assessment of thyroid status.

Summary and Explanation of the Test:

The principal thyroid hormone, thyroxine (T4) circulates almost entirely bound to carrier proteins, chief of which is thyroxine-binding globulin (TBG), in an equilibrium that tends to reassert itself in the face of altered levels of the carrier proteins by inducing a corresponding alteration in the total level of T4 in

Summary and Explanation of the Test (continued):

circulation, while leaving the free T4 concentration level relatively unchanged. Hence, the free T4 concentration may be expected to correlate more closely than the total T4 concentration with clinical thyroid status, for an abnormal total T4 result may signify either an abnormality in thyroid function or simply a variation (physiological or pathological) in the carrier proteins.

Technological Comparison to Predicate:

DPC's IMMULITE® Free T4 (2-Step) is a solid-phase, 2-step chemiluminescent immunoassay. The solid phase, a polystyrene bead enclosed within an IMMULITE® Test Unit, is coated with a monoclonal antibody for T4.

The patient sample is introduced into the Test Unit, and incubated for approximately 30 minutes at 37°C with intermittent agitation. During this time, free T4 in the sample binds to antibody binding sites on the bead. Unbound material is then removed by a centrifugal wash.

An alkaline phosphatase-labeled triiodothyronine is introduced, and the Test Unit is incubated for approximately another 30-minute cycle. The unbound enzyme conjugate is removed by a centrifugal wash. Substrate is then added, and the Test Unit is incubated for a further 10 minutes.

The chemiluminescent substrate, a phosphate ester of adamantyl dioxetane, undergoes hydrolysis in the presence of alkaline phosphatase to yield an unstable intermediate. The continuous production of this intermediate results in the sustained emission of light, thus improving precision by providing a window for multiple readings. The bound complex -- and thus also the photon output, as measured by the luminometer -- is inversely proportional to the concentration of free T4 in the sample.

The IMMULITE® Free T4 (2-step) system has been optimized to leave essentially undisturbed the original equilibrium between free and protein-bound T4 in the patient sample.

The **DPC's Coat-A-Count® Free T4** procedure is a solid-phase radioimmunoassay, wherein ^{125}I-labeled T4 analog competes for a fixed time with free T4 in the patient sample for sites on T4-specific antibody. Because the antibody is immobilized to the wall of a polypropylene tube, simply decanting the supernatant suffices to terminate the competition and to isolate the antibody-bound fraction of the radiolabeled free T4. Counting the tube in a gamma counter then yields a number, which converts by way of calibration curve to measure of the free T4 present in the patient sample.

The Coat-A-Count® Free T4 system has been optimized to eliminate all binding of the T4 analog tracer to endogenous proteins, while leaving essentially undisturbed the original equilibrium between free and protein-bound T4 in the patient sample. The tracer itself has no measurable affinity for thyroxin-binding globulin (TBG), the principal thyroid hormone transport protein. To prevent binding of the tracer to albumin, blocking agents are present, at a concentration carefully adjusted to avoid displacement of native T4 from endogenous carrier proteins. To further minimize the risk of "stripping", the system employs an antibody, at low concentration, with an affinity for T4 slightly less than that of TBG, and operates under physiological conditions of temperature, pH and ionic strength.

Method Comparison:

The IMMULITE® Free T4 (2-Step) procedure was compared to Coat-A-Count® Free T4 assay on 172 patient samples, with free T4 concentrations ranging from approximately 0.3 to 4.8 ng/dL. Linear regression analysis yielded the following statistics:

(IMMULITE® Free T4 2-Step) = 1.01 (Coat-A-Count® Free T4) - 0.02 ng/dL r = 0.946

Mean Values: 1.6 ng/dL (IMMULITE® Free T4 2-Step)
1.6 ng/dL (Coat-A-Count® Free T4)

Performance Equivalence:

Diagnostic Products Corporation asserts that IMMULITE® Free T4 (2-Step) is substantially equivalent to other commercially marketed free T4 assays, such as Coat-A-Count® Free T4. Each product is intended strictly for *in vitro* diagnostic use as an aid in the clinical assessment of thyroid status.

Conclusion:

The data presented in this summary of safety and effectiveness is the data that the Food and Drug Administration used in granting DPC substantial equivalence for IMMULITE® Free T4 (2-Step).

Edward M. Levine, Ph.D.
Director, Clinical Affairs

5/14/97
Date

510(k) Number (if known): K971792

Device Name: IMMULITE® Free T4 (2-Step)

Indications For Use:

DPC's IMMULITE® Free T4 is intended for use with the IMMULITE® Automated Analyzer. It is a solid-phase, 2-step chemiluminescent enzyme immunoassay designed for the quantitative measurement of non-protein-bound thyroxine (free T4) levels in serum. It is intended strictly for *in vitro* use as an aid in the clinical assessment of thyroid status related to abnormality in thyroid function or simply a variation (physiological or pathological) in the carrier proteins, chief of which is thyroxine-binding globulin (TBG). This assay is useful in assessment of thyroid status due to TBG elevations typical of pregnancy, oral contraceptive use and estrogen therapy. Additionally, this test system is for use as an aid in detecting alterations in the TBG level which mask the effects of abnormal thyroid function in hypothyroid and hyperthyroid patients.

(Division Sign-Off)
Division of Clinical Laboratory Devices
510(k) Number K971792

(PLEASE DO NOT WRITE BELOW THIS LINE - CONTINUE ON ANOTHER PAGE IF NEEDED)

Concurrence of CDRH, Office of Device Evaluation (ODE)

Prescription Use ✓ OR Over-The-Counter Use_____
(Per 21 CFR 801.109)

(Optional Format 1-2-96)