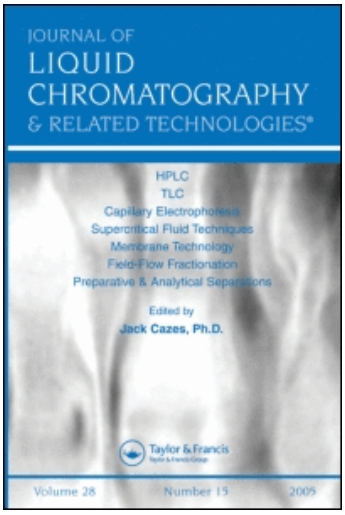

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THE ZYMATE LABORATORY AUTOMATION SYSTEMS

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Zymark Corporation, the pioneer in laboratory robotics, introduced the Zymate Laboratory Automation System in 1982 with shipments beginning in 1983. By the spring of 1986, over 700 systems were in place, making laboratory robotics the fastest growing new technology for the laboratory.

The Zymate System is the only laboratory robotic system specifically designed for chemistry and biotechnology laboratories. One of the important benefits of this is the Zymate System provides robotic motions that are natural for the laboratory environment. These natural motions provide a pure reach motion and a pure vertical lifting motion so critical to laboratory procedures. The motions of the Zymate Robot are natural for tasks such as:

Vertically lifting tubes, beakers and flasks from racks.

Reaching for objects and positioning objects where a pure horizontal motion is most efficient or even required.

Pouring from one container to another

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Rapidly accessing multiple laboratory stations with fast rotary motion.

From the beginning, the Zymate System has combined the technologies of chemistry, analytical instrumentation, microcomputers and robotics into an integrated system to perform a wide range of laboratory procedures. Not only can the system perform laboratory operations, but it can acquire data and test that data against predetermined quality criteria. If necessary, the system can rerun a sample, run a standard or control, or modify the procedure until valid data is obtained. Figure 1 shows a picture of the Zymate System for HPLC analysis.

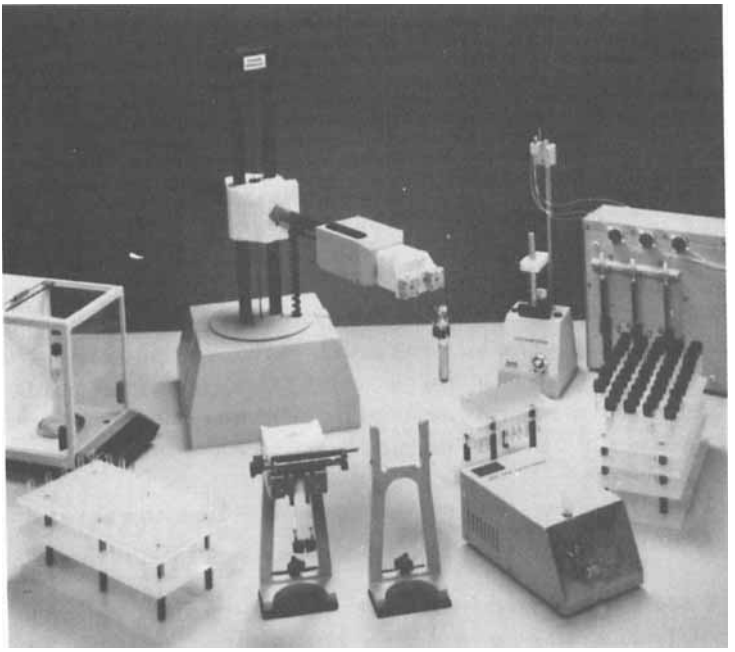

Figure 1. The Zymate System for HPLC Analysis.

The Zymate System has grown to now include over 50 uniquely different laboratory stations, interchangeable hands and interfaces to other instruments or computers. This comprehensive array of accessories makes the Zymate System applicable for automating nearly all laboratory procedures.

Based on feedback from users of the original Zymate I System, the Zymate II System was introduced in early 1986. The Zymate II System consists of a second generation Zymate II Robot and Controller (see Figure 2).

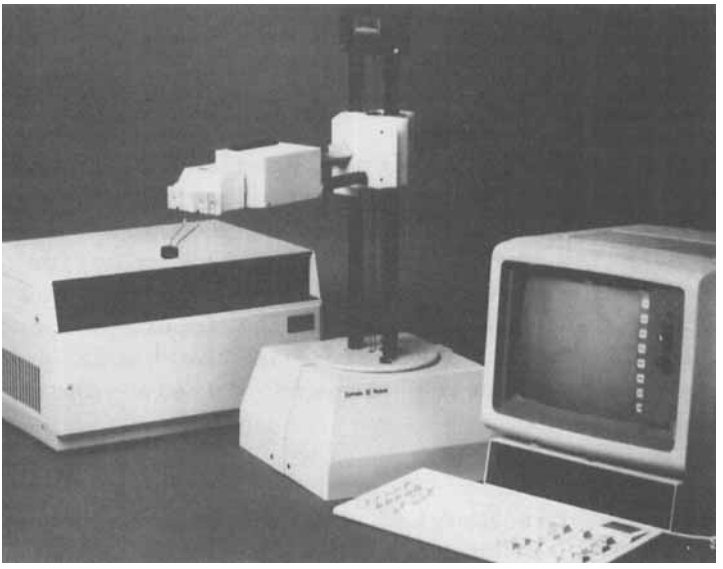

Figure 2. The Zymate II Robot and Controller.

The Zymate II robot incorporates many new advanced features:

High Speed - The three base axes (vertical, horizontal and rotary) can run up to twice the speed of the Zymate II. In addition the speed is adjustable over a 5:1 range.

Tactile Sensing - Force levels on the hand and base axes can be monitored to provide automatic verification without use of external sensor.

Collision Detection - Automatically detects a collision in base axis motions and automatically stops and reinitializes the robot.

Transition Positions - Provides fast transitions through non-critical positions by starting the move to a subsequent position before reaching the exact non-critical position.

Modular Hand/Wrist Motion - Hand and wrist motions can operate simultaneously with base motions. This allows the robot hand to get into position for a sample transfer while the arm is still in motion.

Other features include analog inputs and output voltages directly accessible on the hands and the ability to determine liquid levels during a procedure.

The new Zymate II controller consists of a terminal and the EasyLab Controller. The terminal consists of a keyboard, monitor and disk drive. The Controller has the ability to control up to 25 modules and monitor and control external events.

Some advanced features of the Zymate II Controller are expanded memory, high speed math processor and string processing capability. The string processing capability permits the Zymate

System to take alpha-numeric information from a bar code reader and transmit alpha-numeric information from a bar code reader and transmit alpha-numeric information to a printer or computer.

One of the keys to the rapid acceptance of the Zymate System, has been the easy-to-use EasyLab Software. EasyLab allows the chemist to program using common laboratory names and descriptions. A new programming language does not have to be learned. FastPak applications software, a new tamplate resting on EasyLab, allows many laboratory procedures to come preprogrammed. Preprogrammed procedures are available for pipetting, dispensing, capping, centrifugation, etc.

Integration various types of other analytical instruments with the Zymate System has provided increased performance and more complete automation. Over 30 different analytical instruments have been interfaced to Zymate Systems to date. Automate needs vary from laboratory to laboratory. Quality control laboratories might emphasize user simplicity and high throughput while research laboratories might stress flexibility. The Zymate System offers a wide range of potential benefits which can be tailored to your needs and those of your laboratory for todays needs and those of tomorrow.