

**UNITED STATES
SECURITIES AND EXCHANGE COMMISSION**
Washington, D.C. 20549

**POST-EFFECTIVE AMENDMENT NO. 1
TO
FORM S-8
REGISTRATION STATEMENT**
*Under
The Securities Act of 1933*

KLA-TENCOR CORPORATION

(Exact name of registrant as specified in its charter)

Delaware
(State or other jurisdiction of
incorporation or organization)

04-2564110
(IRS Employer
Identification No.)

**One Technology Drive
Milpitas, California 95035**
(Address, including zip code, of principal executive offices)

KLA-Tencor 401(k) Plan
(Full title of the Plan)

Brian M. Martin
Senior Vice President and General Counsel
KLA-Tencor Corporation
One Technology Drive
Milpitas, California 95035
(408) 875-3000
(Name, address including zip code, and telephone number,
including area code, of agent for service)

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, or a smaller reporting company. See the definitions of "large accelerated filer," "accelerated filer" and "smaller reporting company" in Rule 12b-2 of the Exchange Act. (Check one):

Large accelerated filer

Accelerated filer

Non-accelerated filer (Do not check if a smaller reporting company)

Smaller reporting company

EXPLANATORY STATEMENT

KLA-Tencor Corporation (the "**Registrant**") is filing this Post-Effective Amendment No. 1 to Registration Statement on Form S-8 to deregister certain of the securities previously registered for issuance under the KLA-Tencor 401(k) Plan (the "**401(k) Plan**") by the Registrant pursuant to Registration Statements on Form S-8 (Registration Nos. 333-46598, 333-49766 and 333-60866), filed with the Securities and Exchange Commission on September 26, 2000, November 13, 2000 and May 14, 2001, respectively (collectively, the "**Registration Statements**"). The Registration Statements, in aggregate, originally registered 3,500,000 shares of Common Stock of the Registrant and associated plan interests for employees who elected to purchase shares of the Registrant's Common Stock under the 401(k) Plan. The Registrant has eliminated the ability of employees to purchase or hold shares of the Registrant's Common Stock under the 401(k) Plan and is therefore filing this Post-Effective Amendment No. 1 to deregister all plan interests and any shares of the Registrant's Common Stock that have not been issued under the 401(k) Plan.

SIGNATURES

The Registrant. Pursuant to the requirements of the Securities Act of 1933, as amended, the Registrant has duly caused this Post-Effective Amendment No. 1 to the Registration Statements to be signed on its behalf by the undersigned, thereunto duly authorized, in the City of Milpitas, State of California, on the 6th day of May, 2009.

KLA-TENCOR CORPORATION

By: /s/ BRIAN M. MARTIN
Name: Brian M. Martin
Title: Senior Vice President and General Counsel

POWER OF ATTORNEY

KNOW ALL PERSONS BY THESE PRESENTS:

That the undersigned officers and directors of KLA-Tencor Corporation, a Delaware corporation, do hereby constitute and appoint Mark P. Dentinger and Brian M. Martin or any one of them, the lawful attorney-in-fact and agent, each with full power and authority to do any and all acts and things and to execute any and all instruments which said attorney and agent determines may be necessary or advisable or required to enable said corporation to comply with the Securities Act of 1933, as amended, and any rules or regulations or requirements of the Securities and Exchange Commission in connection with this Post-Effective Amendment No. 1 to the Registration Statements. Without limiting the generality of the foregoing power and authority, the powers granted include the power and authority to sign the names of the undersigned officers and directors in the capacities indicated below to this Post-Effective Amendment No. 1 to the Registration Statements, to any and all amendments, both pre-effective and post-effective, and supplements to the underlying Registration Statements, and to any and all instruments or documents filed as part of or in conjunction with this Post-Effective Amendment No. 1 to the Registration Statements or further amendments or supplements to the underlying Registration Statements, and each of the undersigned hereby ratifies and confirms all that said attorneys and agents, or any one of them, shall do or cause to be done by virtue hereof. This Power of Attorney may be signed in several counterparts.

IN WITNESS WHEREOF, each of the undersigned has executed this Power of Attorney as of the date indicated.

Pursuant to the requirements of the Securities Act of 1933, as amended, this Post-Effective Amendment No. 1 to the Registration Statements has been signed below by the following persons in the capacities and on the dates indicated.

| <u>Signature</u> | <u>Title</u> | <u>Date</u> |
|---|--|-------------|
| <u>/s/ RICHARD P. WALLACE</u> Richard P. Wallace | President and Chief Executive Officer and Director (principal executive officer) | May 6, 2009 |
| <u>/s/ MARK P. DENTINGER</u> Mark P. Dentinger | Executive Vice President and Chief Financial Officer (principal financial officer) | May 6, 2009 |
| <u>/s/ VIRENDRA A. KIRLOSKAR</u> Virendra A. Kirloskar | Chief Accounting Officer (principal accounting officer) | May 6, 2009 |

| | | |
|---|------------------------------------|-------------|
| <u>/s/ EDWARD W. BARNHOLT</u> Edward W. Barnholt | Chairman of the Board and Director | May 6, 2009 |
| <u>/s/ ROBERT P. AKINS</u> Robert P. Akins | Director | May 6, 2009 |
| <u>/s/ ROBERT T. BOND</u> Robert T. Bond | Director | May 6, 2009 |
| <u>/s/ ROBERT M. CALDERONI</u> Robert M. Calderoni | Director | May 6, 2009 |
| <u>/s/ JOHN T. DICKSON</u> John T. Dickson | Director | May 6, 2009 |
| <u>/s/ STEPHEN P. KAUFMAN</u> Stephen P. Kaufman | Director | May 6, 2009 |
| <u>/s/ KEVIN J. KENNEDY</u> Kevin J. Kennedy | Director | May 6, 2009 |

The Plan. Pursuant to the requirements of the Securities Act of 1933, as amended, the plan administrator of the KLA-Tencor 401(k) Plan has duly caused this Post-Effective Amendment No. 1 to the Registration Statements to be signed on behalf of the KLA-Tencor 401(k) Plan by the undersigned, thereunto duly authorized, in the City of Milpitas, State of California, on the 6th day of May, 2009.

KLA-TENCOR 401(k) Plan
(Name of Plan)

By: /s/ BRIAN M. MARTIN
Name: Brian M. Martin
Title: Senior Vice President and General Counsel of KLA-Tencor Corporation, Plan Administrator