

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

**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)

Amended and Restated 1997 Employee Stock Purchase 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, as 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
Non-accelerated filer

(Do not check if a smaller reporting company)

Accelerated filer
Smaller reporting company

CALCULATION OF REGISTRATION FEE

Title of Securities to be Registered	Amount to be Registered(1)	Proposed Maximum Offering Price per Share	Proposed Maximum Aggregate Offering Price	Amount of Registration Fee
Common Stock, \$0.01 par value, to be issued under the Amended and Restated 1997 Employee Stock Purchase Plan	1,000,000	\$ 26.73(2)	\$26,730,000	\$1,491.54

- (1) Amount of securities to be registered computed in accordance with Rule 457(h) of the Securities Act of 1933, as amended, (the "Securities Act") as the maximum number of additional shares of the Registrant's Common Stock issuable under the plan covered by this Registration Statement. Pursuant to Rule 416(a) of the Securities Act, this Registration Statement shall also cover any additional shares of the Registrant's Common Stock that become issuable under the plan covered by this Registration Statement with respect to the shares registered hereby by reason of any stock split, stock dividend, recapitalization or other similar transaction effected without the Registrant's receipt of consideration that results in an increase in the number of the Registrant's outstanding shares of Common Stock.
- (2) Calculated under Rule 457(h) of the Securities Act solely for the purpose of calculating the registration fee on the basis of 95% of the average of the high and low selling prices per share of the Registrant's Common Stock on May 4, 2009 as reported by the NASDAQ Global Select Market.

INCORPORATION OF DOCUMENTS BY REFERENCE TO PRIOR REGISTRATION STATEMENT

This Registration Statement is filed for the purpose of registering 1,000,000 additional shares of Common Stock, \$0.01 par value, of KLA-Tencor Corporation (the "Registrant") for use in connection with the Registrant's 1997 Amended and Restated Employee Stock Purchase Plan (the "Plan"). A Registration Statement on Form S-8 (No. 333-152864) that was filed with the Securities and Exchange Commission on August 7, 2008 (the "Prior Registration Statement") relating to the Plan is effective. Accordingly, in accordance with General Instruction E to Form S-8, the Registrant hereby incorporates by reference herein the contents of the Prior Registration Statement.

PART II Information Required in the Registration Statement

Item 8. Exhibits

<u>Exhibit Number</u>	<u>Exhibit</u>
4.1(1)	Amended and Restated Certificate of Incorporation.
4.2(2)	Certificate of Amendment of Amended and Restated Certificate of Incorporation.
4.3(3)	Amended and Restated Bylaws of the Registrant.
4.4(4)	Amended and Restated Rights Agreement dated as of April 25, 1996, between the Registrant and The First National Bank of Boston, as Rights Agent. This agreement includes the Form of Right Certificate as Exhibit A thereto and the Summary of Terms of Rights as Exhibit B thereto.
5.1	Opinion of Brian M. Martin, Esq.
10.1(5)	Amended and Restated 1997 Employee Stock Purchase Plan.
23.1	Consent of Independent Registered Public Accounting Firm.
23.2	Consent of Brian M. Martin, Esq. (included in Exhibit 5.1).
24.1	Power of Attorney (included on signature page).
(1)	Incorporated by reference to Exhibit 3.1 to the Registrant's Quarterly Report on Form 10-Q for the quarter ended March 31, 1997 (Commission File No. 000-09992).
(2)	Incorporated by reference to Exhibit 3.1 to the Registrant's Quarterly Report on Form 10-Q for the quarter ended December 31, 2000 (Commission File No. 000-09992).
(3)	Incorporated by reference to Exhibit 3.1 to the Registrant's Current Report on Form 8-K, filed with the SEC on February 19, 2009 (Commission File No. 000-09992).
(4)	Incorporated by reference to Exhibit 1 of the Registrant's report on Form 8-A/A Amendment No. 2 to the Registration Statement on Form 8-A filed with the SEC on September 24, 1996 (Commission File No. 000-09992).
(5)	Incorporated by reference to Exhibit 10.52 to the Registrant's Current Report on Form 8-K, filed with the SEC on March 30, 2009 (Commission File No. 000-09992).

SIGNATURES

Pursuant to the requirements of the Securities Act of 1933, as amended, the Registrant certifies that it has reasonable grounds to believe that it meets all of the requirements for filing on Form S-8 and has duly caused this Registration Statement 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 Registration Statement. 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 Registration Statement, to any and all amendments, both pre-effective and post-effective, and supplements to this Registration Statement, and to any and all instruments or documents filed as part of or in conjunction with this Registration Statement or amendments or supplements thereof, 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 Registration Statement 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

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OPINION OF BRIAN M. MARTIN, ESQ.

[KLA-Tencor Corporation letterhead]

May 6, 2009

KLA-Tencor Corporation
One Technology Drive
Milpitas, California 95035

Re: Registration Statement on Form S-8

Ladies and Gentlemen:

KLA-Tencor Corporation, a Delaware corporation (the "Company"), is filing with the Securities and Exchange Commission a Registration Statement on Form S-8 (the "Registration Statement") for the purpose of registering under the Securities Act of 1933, as amended (the "Securities Act"), an additional 1,000,000 shares of the Common Stock reserved for issuance under the Company's Amended and Restated 1997 Employee Stock Purchase Plan (the "1997 ESPP"), as described in the Registration Statement. Such shares of Common Stock are collectively referred to herein as the "Shares."

I have acted as General Counsel to the Company with respect to the issuance of this opinion and, as such counsel, I have examined such documents and such matters of fact and law that I have deemed necessary for the purpose of rendering the opinion expressed herein. In such examinations, I have assumed the genuineness of all signatures and the authenticity of all documents submitted to me as originals and the conformity to original documents of all documents submitted to me as conformed or photostatic copies.

Based on the foregoing, I am of the opinion that when the Shares have been duly issued and delivered in accordance with the terms and conditions of the 1997 ESPP, such Shares will be validly issued, fully paid and non-assessable.

I hereby consent to the filing of this opinion as an Exhibit to the Registration Statement.

Sincerely,

/s/ BRIAN M. MARTIN

Brian M. Martin
Senior Vice President and General Counsel
KLA-Tencor Corporation

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We hereby consent to the incorporation by reference in this Registration Statement on Form S-8 of our report dated August 7, 2008 relating to the financial statements, financial statement schedule and the effectiveness of internal control over financial reporting, which appears in KLA-Tencor Corporation's Annual Report on Form 10-K for the year ended June 30, 2008.

/s/ PRICEWATERHOUSECOOPERS LLP

San Jose, California
May 6, 2009