

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.)

160 Rio Robles
San Jose, California 95134-1809
(Address, including zip code, of principal executive offices)

ADE Corporation 2000 Employee Stock Option Plan
ADE Corporation 1997 Employee Stock Option Plan
ADE Corporation 1995 Stock Option Plan
(Full titles of the Plans)

Jeffrey L. Hall
Chief Financial Officer
KLA-Tencor Corporation
160 Rio Robles
San Jose, California 95134-1809
(Name, address including zip code, and telephone number,
including area code, of agent for service)

Copies to:
William M. Kelly, Esq.
Davis Polk & Wardwell
1600 El Camino Real
Menlo Park, California 94025
(650) 752-2000

CALCULATION OF REGISTRATION FEE

Title of Securities to be Registered	Amount to be Registered (1)	Proposed Maximum Offering Price per Share (2)	Proposed Maximum Aggregate Offering Price (2)	Amount of Registration Fee
Common Stock, \$0.01 par value	175,800	\$ 49.445	\$ 8,692,431	\$ 930.09

- (1) This Registration Statement covers 175,800 shares underlying options assumed by KLA-Tencor Corporation pursuant to the Amended and Restated Agreement and Plan of Merger dated as of May 26, 2006 among ADE Corporation, KLA-Tencor Corporation and South Acquisition Corporation, a wholly-owned subsidiary of KLA-Tencor Corporation. This Registration Statement shall also cover any additional shares of common stock which become issuable under the plans covered by this Registration Statement by reason of any stock dividend, stock split, recapitalization or other similar transaction effected without the Registrant's receipt of consideration which results in an increase in the number of the outstanding shares of the Registrant's common stock.
- (2) Calculated under Rule 457(h) of the Securities Act of 1933, as amended, on the basis of the average of the high and low selling prices per share of the Registrant's common stock on February 12, 2007 as reported by the NASDAQ Global Market.

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PART II
Information Required in the Registration Statement

Item 3. Incorporation of Documents by Reference

KLA-Tencor Corporation (the "Registrant") hereby incorporates by reference into this Registration Statement the following documents previously filed with the Securities and Exchange Commission (the "SEC"):

- (a) The Corporation's Annual Report on Form 10-K for the fiscal year ended June 30, 2006, filed with the SEC on January 29, 2007;
- (b) The Corporation's Quarterly Report on Form 10-Q for the period ended September 30, 2006, filed with the SEC on January 29, 2007;
- (c) The Corporation's Quarterly Report on Form 10-Q for the period ended December 31, 2006, filed with the SEC on February 9, 2007;
- (d) The Corporation's Current Reports on Form 8-K filed with the SEC on July 11, 2006, July 26, 2006, August 3, 2006, August 7, 2006, August 29, 2006, September 15, 2006, September 20, 2006, October 3, 2006 (Item 1.01), October 3, 2006 (Items 4.02, 5.04, 8.01 and 9.01, as amended and only to the extent filed and not furnished), October 6, 2006, October 12, 2006, October 18, 2006, October 30, 2006, November 6, 2006, November 16, 2006, December 27, 2006, January 5, 2007, January 31, 2007 and February 2, 2007;
- (e) The description of the Registrant's Common Stock as set forth in the Registration Statement filed by the Registrant on Form 8-A on March 29, 1989 (File No. 000-09992) pursuant to Section 12(g) of the Exchange Act and any amendments or reports thereto filed with the Securities and Exchange Commission for the purpose of updating such description including Amendment No. 1 to Form 8-A filed September 25, 1995 and Amendment No. 2 to Form 8-A filed September 24, 1996; and
- (f) All other descriptions of the Registrant's Common Stock contained in a registration statement filed under the Exchange Act, including any amendment or report filed for the purpose of updating such description.

All reports and definitive proxy or information statements filed pursuant to Section 13(a), 13(c), 14 or 15(d) of the 1934 Act after the date of this Registration Statement and prior to the filing of a post-effective amendment which indicates that all securities offered hereby have been sold or which deregisters all securities then remaining unsold shall be deemed to be incorporated by reference into this Registration Statement and to be a part hereof from the date of filing of such documents. Any statement contained in a document incorporated or deemed to be incorporated by reference herein shall be deemed to be modified or superseded for purposes of this Registration Statement to the extent that a statement contained herein or in any subsequently filed document which also is deemed to be incorporated by reference herein modifies or supersedes such statement. Any such statement so modified or superseded shall not be deemed, except as so modified or superseded, to constitute a part of this Registration Statement.

Item 4. Description of Securities

Not Applicable.

Item 5. Interests of Named Experts and Counsel

Not Applicable.

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Item 6. Indemnification of Directors and Officers

Section 145(a) of the Delaware General Corporation Law (the "DGCL") provides in relevant part that "[a] corporation shall have power to indemnify any person who was or is a party or is threatened to be made a party to any threatened, pending or completed action, suit or proceeding, whether civil, criminal, administrative or investigative (other than an action by or in the right of the corporation) by reason of the fact that the person is or was a director, officer, employee or agent of the corporation, or is or was serving at the request of the corporation as a director, officer, employee or agent of another corporation, partnership, joint-venture, trust or other enterprise, against expenses (including attorneys' fees), judgments, fines and amounts paid in settlement actually and reasonably incurred by the person in connection with such action, suit or proceeding if the person acted in good faith and in a manner the person reasonably believed to be in or not opposed to the best interests of the corporation, and, with respect to any criminal action or proceeding, had no reasonable cause to believe the person's conduct was unlawful." With respect to derivative actions, Section 145(b) of the DGCL provides in relevant part that "[a] corporation shall have power to indemnify any person who was or is a party or is threatened to be made a party to any threatened, pending or completed action or suit by or in the right of the corporation to procure a judgment in its favor by reason of the fact that the person is or was a director, officer, employee or agent of the corporation, or is or was serving at the request of the corporation as a director, officer, employee or agent of another corporation, partnership, joint venture, trust or other enterprise, against expenses (including attorneys' fees) actually and reasonably incurred by the person in connection with the defense or settlement of such action or suit if the person acted in good faith and in a manner reasonably believed to be in or not opposed to the best interests of the corporation and except that no indemnification shall be made in respect of any claim, issue or matter as to which such person shall have been adjudged to be liable to the corporation unless and only to the extent that the Court of Chancery or the court in which such action or suit was brought shall determine upon application that, despite the adjudication of liability but in view of all the circumstances of the case, such person is fairly and reasonably entitled to indemnity for such expenses which the Court of Chancery or such other court shall deem proper."

The Registrant's Amended and Restated Certificate of Incorporation provides that to the fullest extent permitted by the DGCL, no director of the Registrant shall be personally liable to the Registrant or its stockholders for monetary damages for breach of fiduciary duty as a director. The Amended and Restated Certificate of Incorporation also provides that no amendment or repeal of such provision shall apply to or have any effect on the right to indemnification permitted thereunder with respect to claims arising from acts or omissions occurring in whole or in part before the effective date of such amendment or repeal whether asserted before or after such amendment or repeal.

The Registrant's Bylaws provide that the Registrant shall indemnify to the fullest extent permitted by the DGCL each of its directors, officers, employees and other agents against expenses actually and reasonably incurred in connection with any proceeding arising by reason of the fact that such person is or was an agent of the Registrant.

The Registrant has entered into indemnification agreements with its directors and executive officers and intends to enter into indemnification agreements with any new directors and executive officers in the future.

Item 7. Exemption from Registration Claimed

Not Applicable.

Item 8. Exhibits

See Exhibit Index.

Item 9. Undertakings

A. The undersigned Registrant hereby undertakes:

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(1) to file, during any period in which offers or sales are being made, a post-effective amendment to this Registration Statement (i) to include any prospectus required by Section 10(a)(3) of the Securities Act of 1933 (the "1933 Act"), (ii) to reflect in the prospectus any facts or events arising after the effective date of this Registration Statement (or the most recent post-effective amendment thereof) which, individually or in the aggregate, represent a fundamental change in the information set forth in this Registration Statement and (iii) to include any material information with respect to the plan of distribution not previously disclosed in this Registration Statement or any material change to such information in this Registration Statement; provided, however, that clauses (1)(i) and (1)(ii) shall not apply if the information required to be included in a post-effective amendment by those paragraphs is contained in periodic reports filed by the Registrant pursuant to Section 13 or Section 15(d) of the 1934 Act that are incorporated by reference into this Registration Statement;

(2) that for the purpose of determining any liability under the 1933 Act each such post-effective amendment shall be deemed to be a new registration statement relating to the securities offered therein and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof; and

(3) to remove from registration by means of a post-effective amendment any of the securities being registered which remain unsold at the termination of the offering.

B. The undersigned Registrant hereby undertakes that, for purposes of determining any liability under the 1933 Act, each filing of the Registrant's annual report pursuant to Section 13(a) or Section 15(d) of the 1934 Act that is incorporated by reference into this Registration Statement shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof.

C. Insofar as indemnification for liabilities arising under the 1933 Act may be permitted to directors, officers, or controlling persons of the Registrant pursuant to the indemnification foregoing provisions summarized in Item 6 or otherwise, the Registrant has been advised that, in the opinion of the SEC, such indemnification is against public policy as expressed in the 1933 Act, and is, therefore, unenforceable. In the event that a claim for indemnification against such liabilities (other than the payment by the Registrant of expenses incurred or paid by a director, officer, or controlling person of the Registrant in the successful defense of any action, suit, or proceeding) is asserted by such director, officer, or controlling person in connection with the securities being registered, the Registrant will, unless in the opinion of its counsel the matter has been settled by controlling precedent, submit to a court of appropriate jurisdiction the question whether such indemnification by it is against public policy as expressed in the 1933 Act and will be governed by the final adjudication of such issue.

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 San Jose, State of California, on the 14th day of February, 2007.

KLA-TENCOR CORPORATION

By: /s/ Jeffrey L. Hall
Name: Jeffrey L. Hall
Title: Chief Financial Officer

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 Jeffrey L. Hall the lawful attorney-in-fact and agent 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 attorney and agent 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	<u>Chief Executive Officer and Director (principal executive officer)</u>	<u>February 14, 2007</u>
<u>/s/ Jeffrey L. Hall</u> Jeffrey L. Hall	<u>Senior Vice President and Chief Financial Officer (principal financial officer and principal accounting officer)</u>	<u>February 14, 2007</u>

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<u>Signature</u>	<u>Title</u>	<u>Date</u>
<u>/s/ Edward W. Barnholt</u> Edward W. Barnholt	Chairman of the Board and Director	February 14, 2007
<u>/s/ H. Raymond Bingham</u> H. Raymond Bingham	Director	February 14, 2007
<u>/s/ Robert T. Bond</u> Robert T. Bond	Director	February 14, 2007
<u>/s/ Stephen P. Kaufman</u> Stephen P. Kaufman	Director	February 14, 2007
<u>/s/ Lida Urbanek</u> Lida Urbanek	Director	February 14, 2007
<u>/s/ David C. Wang</u> David C. Wang	Director	February 14, 2007

EXHIBIT INDEX

<u>Exhibit Number</u>	<u>Exhibit</u>
4.1(1)	Amended and Restated Certificate of Incorporation, as amended.
4.2(2)	Certificate of Amendment of Amended and Restated Certificate of Incorporation.
4.3(3)	Bylaws of the Registrant, as amended.
4.4(4)	Amended and Restated Rights Agreement dated as of April 25, 1996, between the Registrant and First National Bank of Boston, as Rights Agent. This agreement includes the Form of Right Certificate as Exhibit A and the Summary of Terms of Rights as Exhibit B thereto.
5.1	Opinion of Counsel.
10.1(5)	ADE Corporation's 2000 Employee Stock Option Plan (as amended).
10.2 (6)	Amendment to ADE Corporation's 1997 Employee Stock Option Plan dated April 7, 1999.
10.3(7)	ADE Corporation 1997 Employee Stock Option Plan.
10.4(8)	ADE Corporation's 1995 Stock Option Plan.
23.1	Consent of Independent Registered Public Accounting Firm.
23.2	Consent of Counsel (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 3.2 to the Registrant's Registration Statement on Form S-8, filed December 4, 1998 (Commission File No. 333-68415).

(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 September 24, 1996 (Commission File No. 000-09992).

(5) Incorporated by reference to Exhibit 10.2 to ADE Corporation's Annual Report on Form 10-K for the fiscal year ended April 30, 2006 (Commission File No. 000-26714).

(6) Incorporated by reference to Exhibit 10.3 to ADE Corporation's Annual Report on Form 10-K for the fiscal year ended April 30, 1999 (Commission File No. 000-26714).

(7) Incorporated by reference to Exhibit 4.3 to ADE Corporation's Registration Statement on Form S-8, filed February 18, 1998 (Commission File No. 333-46505).

(8) Incorporated by reference to Exhibit 10.4 to ADE Corporation's Registration Statement on Form S-1 (Commission File No. 33-96408).

OPINION OF COUNSEL

[Davis Polk & Wardwell letterhead]

February 15, 2007

KLA-Tencor Corporation
160 Rio Robles
San Jose, California 95134-1809

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 aggregate of 175,800 shares of its common stock, par value \$0.001 per share (the "Common Stock"), issuable pursuant to the ADE Corporation 2000 Employee Stock Option Plan, the ADE Corporation 1997 Employee Stock Option Plan and the ADE Corporation 1995 Stock Option Plan (together, the "Plans"), as described in the Registration Statement.

We, as your counsel, have examined such documents and such matters of fact and law that we have deemed necessary for the purpose of rendering the opinion expressed herein. Based on the foregoing, we advise you that, in our opinion, when the Common Stock has been duly issued and delivered in accordance with the terms and conditions of the Plans, the Common Stock will be validly issued, fully paid and non-assessable.

We are members of the Bars of the States of New York and California and the foregoing opinion is limited to the federal laws of the United States and the General Corporation Law of the State of Delaware.

We hereby consent to the filing of this opinion as an Exhibit to the Registration Statement. In giving this consent, we do not admit that we are in the category of persons whose consent is required under Section 7 of the Securities Act.

Sincerely,

/s/ Davis Polk & Wardwell

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 January 28, 2007 relating to the financial statements, financial statement schedules, management's assessment of the effectiveness of internal control over financial reporting 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, 2006.

/s/ PricewaterhouseCoopers LLP

San Jose, California

February 15, 2007