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

**FORM S-4
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)

3827
(Primary Standard Industrial
Classification Code Number)

04-2564110
(I.R.S. Employer
Identification Number)

**One Technology Drive
Milpitas, California 95305
(408) 875-3000**

(Address, including zip code, and telephone number, including area code, of Registrant's principal executive offices)

**Teri A. Little
Executive Vice President and Chief Legal Officer
KLA-Tencor Corporation
One Technology Drive
Milpitas, California 95305
(408) 875-3000**

(Name, address, including zip code, and telephone number, including area code, of agent for service)

Copies to:

**Bradley L. Finkelstein
Douglas K. Schnell
Wilson Sonsini Goodrich & Rosati
Professional Corporation
650 Page Mill Road
Palo Alto, California 94304
Tel: (650) 493-9300
Fax: (650) 493-6811**

**Jeffrey Cannon
KLA-Tencor Corporation
One Technology Drive
Milpitas, California 95305
Tel: (408) 875-3000
Fax: (408) 875-4266**

**Michael Havin
Orbotech Ltd.
7 Sanhedrin Boulevard
North Industrial Zone
Yavne 8110101, Israel
Tel: +972-8-9423622
Fax: +972-8-9438769**

**LizabethAnn R. Eisen
Cravath, Swaine & Moore LLP
Worldwide Plaza
825 Eighth Avenue
New York, New York 10019
Tel: (212) 474-1930
Fax: (212) 474-3700**

Approximate date of commencement of proposed sale of the securities to the public: As soon as practicable after this Registration Statement becomes effective and upon completion of the merger described in the enclosed proxy statement/prospectus.

If the securities being registered on this Form are being offered in connection with the formation of a holding company and there is compliance with General Instruction G, check the following box.

If this Form is filed to register additional securities for an offering pursuant to Rule 462(b) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering. Registration No. 333-224982

If this Form is a post-effective amendment filed pursuant to Rule 462(d) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering.

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, anon-accelerated filer, a smaller reporting company, or emerging growth company. See the definitions of “large accelerated filer,” “accelerated filer,” “smaller reporting company” and “emerging growth company” in Rule 12b-2 of the Exchange Act.

Large accelerated filer Accelerated filer
 Non-accelerated filer Smaller reporting company
 Emerging growth company

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 7(a)(2)(B) of the Securities Act.

If applicable, place an X in the box to designate the appropriate rule provision relied upon in conducting this transaction:

- Exchange Act Rule 13e-4(i) (Cross-Border Issuer Tender Offer)
 Exchange Act Rule 14d-1(d) (Cross-Border Third-Party Tender Offer)

CALCULATION OF REGISTRATION FEE

Title of Each Class of Securities to be Registered(1)	Amount to be Registered(2)	Proposed Maximum Offering Price Per Unit	Proposed Maximum Aggregate Offering Price(3)	Amount of Registration Fee(4)
Shares of Common Stock, par value \$0.001 per share	30,000	N/A	\$2,527,488	\$307

- (1) This Registration Statement relates to the common stock, par value \$0.001 per share, of KLA-Tencor Corporation, which we refer to as “KLA-Tencor common stock,” that is issuable to the holders of ordinary shares, New Israeli Shekels 0.14 nominal (par) value per share, of Orbotech Ltd., which we refer to as “Orbotech ordinary shares,” who will receive shares of the KLA-Tencor common stock and cash as consideration for the cancellation of their Orbotech ordinary shares in the proposed merger of Tiburon Merger Sub Technologies Ltd., a wholly owned subsidiary of KLA-Tencor Corporation, with and into Orbotech Ltd., with Orbotech Ltd. surviving as a wholly owned subsidiary of KLA-Tencor Corporation, KLA-Tencor common stock is listed on the NASDAQ Global Select Market under the symbol “KLAC.” Orbotech ordinary shares are listed on the NASDAQ Global Select Market under the symbol “ORBK.”
- (2) Represents the maximum number of additional shares of common stock of KLA-Tencor Corporation estimated to be issued in connection with the merger described herein. The Registrant has previously registered 12,298,994 shares of common stock pursuant to the registration statement on Form S-4 (Registration No. 333-224982), which was declared effective on June 7, 2018. The Registrant now anticipates that up to 12,328,994 shares of its common stock may be issued pursuant to the merger.
- (3) Estimated solely for purposes of calculating the registration fee required by Section 6(b) of the Securities Act, and calculated pursuant to Rules 457(f)(1) and (f)(3) and 457(c) under the Securities Act. The proposed maximum aggregate offering price of the registrant’s common stock was calculated based upon the market value of Orbotech ordinary shares (the securities to be cancelled in the merger) as follows: the product of (1) the difference between \$59.92, the average of the high and low prices per Orbotech ordinary share on January 28, 2019, as quoted on the NASDAQ Global Select Market, and \$38.86, the per share cash component of the merger consideration and (2) 120,000, the estimated additional number of Orbotech ordinary shares to be converted into the right to receive merger consideration upon completion of the merger.
- (4) The amount of the filing fee, calculated in accordance with Rule 457(c) and Rule 457(f) under the Securities Act, equals 0.0001212 multiplied by the proposed maximum offering price.

This registration statement will become effective automatically upon filing with the Commission pursuant to Rule 462(b) under the Securities Act of 1933, as amended.

EXPLANATORY NOTE

Pursuant to its Registration Statement on Form S-4 (Registration No. 333-224982) (the "Prior Registration Statement"), declared effective as of June 7, 2018, and as amended to date, KLA-Tencor Corporation (the "Registrant") registered an aggregate of 12,298,994 shares of its common stock and paid an aggregate fee of \$134,258. The Registrant is filing this Registration Statement on Form S-4 pursuant to General Instruction K to Form S-4 and Rule 462(b) of the Securities Act of 1933, as amended, solely to register 30,000 additional shares of its common stock for issuance in connection with the consummation of the merger contemplated by the Agreement and Plan of Merger dated as of March 18, 2018, by and among the Registrant, Orbotech Ltd., a company organized under the Laws of the State of Israel and Tiburon Merger Sub Technologies Ltd, a company organized under the Laws of the State of Israel and an indirect wholly owned subsidiary of the Registrant, as amended May 11, 2018. In connection with the registration of additional shares of its common stock, the Registrant is paying an additional registration fee of \$307.

STATEMENT OF INCORPORATION BY REFERENCE

This Registration Statement incorporates by reference the contents of the Prior Registration Statement, including all amendments, supplements and exhibits thereto and all information incorporated or deemed to be incorporated by reference therein. Additional opinions and consents to be filed with this Registration Statement are listed on the Exhibit Index included with this Registration Statement.

Exhibit Index

Exhibit Number	Exhibit Description
5.1*	<u>Opinion and Consent of Wilson Sonsini Goodrich & Rosati, Professional Corporation as to the validity of the shares of KLA-Tencor Corporation common stock</u>
23.1*	<u>Consent of PricewaterhouseCoopers LLP</u>
23.2*	<u>Consent of Kesselman & Kesselman, Certified Public Accountants (Israel)</u>
23.3*	<u>Consent of Wilson Sonsini Goodrich & Rosati, PC (included in the opinion filed as Exhibit 5.1 and incorporated by reference)</u>
24.1**	<u>Power of Attorney</u>
99.2*	<u>Consent of Barclays Capital Inc.</u>

* Filed herewith

** Previously filed with the Registrant's Registration Statement of Form S-4 (No. 333-224982), which was filed with the Securities and Exchange Commission on May 16, 2018

SIGNATURES

Pursuant to the requirements of the Securities Act, the registrant 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 January 31, 2019.

KLA-TENCOR CORPORATION

By: /s/ Teri A. Little
Name: Teri A. Little
Title: Executive Vice President and Chief Legal Officer

Pursuant to the requirements of the Securities Act of 1933, this registration statement has been signed by the following persons in the capacities and on the dates indicated.

<u>Signatures</u>	<u>Title</u>	<u>Date</u>
<u> *</u> Richard P. Wallace	Chief Executive Officer and President and Director (Principal Executive Officer)	January 31, 2019
<u> *</u> Bren D. Higgins	Executive Vice President and Chief Financial Officer (Principal Financial Officer)	January 31, 2019
<u> *</u> Virendra A. Kirloskar	Senior Vice President and Chief Accounting Officer (Principal Accounting Officer)	January 31, 2019
<u> *</u> Edward W. Barnholt	Chairman of the Board	January 31, 2019
<u> *</u> Gary B. Moore	Director	January 31, 2019
<u> *</u> Robert A. Rango	Director	January 31, 2019
<u> *</u> John T. Dickson	Director	January 31, 2019
<u> *</u> Kevin J. Kennedy	Director	January 31, 2019
<u> *</u> Robert M. Calderoni	Director	January 31, 2019
<u> *</u> Kiran M. Patel	Director	January 31, 2019
<u> </u> Emiko Higashi	Director	
<u> </u> Ana G. Pinczuk	Director	
<u> </u> Victor Peng	Director	

* By: /s/ Teri A. Little
Teri A. Little
Attorney-in-fact

January 31, 2019

KLA-Tencor Corporation
One Technology Drive
Milpitas, CA 95305

RE: Registration Statement on Form S-4

Ladies and Gentlemen:

We have examined (1) the Registration Statement on Form S-4 filed by KLA-Tencor Corporation (the "Company") with the Securities and Exchange Commission (the "Commission"), Registration No. 333-224982 (such Registration Statement, as amended to date, the "Initial Registration Statement") in connection with the registration under the Securities Act of 1933, as amended (the "Securities Act"), of shares of the Company's Common Stock, par value \$0.001 per share, to be issued in connection with the merger of Tiburon Merger Sub Technologies Ltd., a company organized under the laws of the State of Israel and a wholly owned subsidiary of the Company, with and into Orbotech Ltd., a company organized under the laws of the State of Israel, as described in the Initial Registration Statement (the "Transaction") and (2) the Registration Statement on Form S-4 (the "462(b) Registration Statement") filed pursuant to Rule 462(b) under the Securities Act, relating to up to an additional 30,000 shares of the Company's Common Stock (the "Additional Shares"), to be issued by the Company in the Transaction. The 462(b) Registration Statement incorporates by reference the Initial Registration Statement that was declared effective by the Commission on June 7, 2018. As legal counsel to the Company in connection with the Transaction, we have examined the proceedings taken and are familiar with the proceedings proposed to be taken by the Company in connection with the issuance of the Additional Shares in the Transaction.

We have relied, without independent verification, on information obtained from certain of the Company's officers as to matters of fact material to the opinions set forth below.

Based upon the foregoing, and subject to the qualifications set forth below, it is our opinion that, as of the date hereof, the Additional Shares have been duly authorized by all necessary corporate action on the Company's part and, when issued in the manner described in the Initial Registration Statement, the Additional Shares will be validly issued, fully paid and non-assessable.

In rendering the opinion above, we have assumed that the 462(b) Registration Statement is effective pursuant to Rule 462(b) of the Securities Act (and will remain effective at the time of issuance of the Additional Shares).

We do not express any opinion on any laws other than the General Corporation Law of the State of Delaware and the federal securities laws of the United States of America.

This opinion is furnished to the Company solely in connection with the 462(b) Registration Statement. We hereby consent to the filing of this opinion as Exhibit 5.1 to the 462(b) Registration Statement and to the reference to our firm name wherever appearing in the Initial Registration Statement (including the proxy statement/prospectus constituting a part thereof), which is incorporated by reference into the 462(b) Registration Statement. In giving this consent, we do not thereby admit that we are in the category of persons whose consent is required under Section 7 of the Securities Act or the rules and regulations of the Commission thereunder, nor do we thereby admit that we are experts with respect to any part of such 462(b) Registration Statement within the meaning of the term "experts" as used in the Securities Act or the rules and regulations of the Commission thereunder.

Very truly yours,

/s/ WILSON SONSINI GOODRICH & ROSATI
Professional Corporation

WILSON SONSINI GOODRICH & ROSATI
Professional Corporation

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We hereby consent to the incorporation by reference in this Registration Statement on Form S-4 of our report dated August 4, 2017 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, 2017, which is incorporated by reference in Amendment No. 1 to the Registration Statement on Form S-4 (No. 333-224982) of KLA-Tencor Corporation. We also consent to the reference to us under the heading "Experts" in Amendment No. 1 to the Registration Statement on Form S-4 (No. 333-224982) of KLA-Tencor Corporation incorporated by reference in this Registration Statement.

/s/ PricewaterhouseCoopers LLP
San Jose, California
January 31, 2019

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We hereby consent to the incorporation by reference in this Registration Statement on FormS-4 of our report dated February 23, 2018 relating to the consolidated financial statements, and the effectiveness of internal control over financial reporting, which appears in Orbotech Ltd.'s Annual Report on Form 20-F for the year ended December 31, 2017, which is incorporated by reference in Amendment No. 1 to the Registration Statement on FormS-4 (No. 333-224982) of KLA-Tencor Corporation. We also consent to the reference to us under the heading "Experts" in Amendment No. 1 to the Registration Statement on Form S-4 (No. 333-224982) of KLA-Tencor Corporation incorporated by reference in this Registration Statement.

Tel Aviv, Israel
January 31, 2019

/s/ Kesselman & Kesselman
Certified Public Accountants (Isr.)
A member of PricewaterhouseCoopers
International Limited



745 Seventh Avenue
New York, NY 10019
United States

January 31, 2019

CONSENT OF BARCLAYS CAPITAL INC.

We have previously consented to (i) the inclusion of our opinion letter, dated March 18, 2018, to the Board of Directors of Orbotech Ltd. (“Orbotech”), as an Annex to the proxy statement/prospectus that forms a part of the Registration Statement on Form S-4 of KLA-Tencor Corporation (“KLA-Tencor”), declared effective as of June 7, 2018, and as amended to date (the “Effective Registration Statement”), relating to the proposed business combination transaction between Orbotech and KLA-Tencor Corporation and (ii) the references in the Effective Registration Statement to such opinion and our firm in the Effective Registration Statement under the headings, “Summary—The Merger”, “The Merger—Background of the Merger”, “The Merger—Orbotech’s Reasons for the Merger; Recommendation of the Orbotech Board”, “The Merger—Opinion of Orbotech’s Financial Advisor”, “The Merger—Certain Projections of Orbotech” and “Annex B—Opinion of Barclays Capital Inc.”.

We hereby consent to the incorporation by reference of the foregoing into a Registration Statement on Form S-4MEF filed on the date hereof for purposes of registering additional shares of the common stock of KLA-Tencor for issuance in connection with the consummation of the proposed business combination transaction.

In giving such consent, we do not admit that we come within the category of persons whose consent is required under Section 7 of the U.S. Securities Act of 1933, as amended, or the rules and regulations adopted by the U.S. Securities and Exchange Commission thereunder, nor do we admit that we are experts with respect to any part of the Registration Statement within the meaning of the term “experts” as used in the U.S. Securities Act of 1933, as amended, or the rules and regulations of the U.S. Securities and Exchange Commission thereunder.

Very truly yours,
BARCLAYS CAPITAL INC.

By: /s/ Richard B. Hardegree
Name: Richard B. Hardegree
Title: Managing Director