

SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

FORM S-3

REGISTRATION STATEMENT UNDER THE SECURITIES ACT OF 1933

MKS INSTRUMENTS, INC.

(Exact name of registrant as specified in its charter)

MASSACHUSETTS
(State or other jurisdiction of
incorporation or organization)

3823
(Primary Standard Industrial
Classification Code Number)

04-2277512
(I.R.S. Employer
Identification Number)

SIX SHATTUCK ROAD
ANDOVER, MA 01810
(978) 975-2350
(Address, including zip code, and telephone number, including area code, of
registrant's principal executive offices)

JOHN R. BERTUCCI
PRESIDENT, CHAIRMAN AND CHIEF EXECUTIVE OFFICER
MKS INSTRUMENTS, INC.
SIX SHATTUCK ROAD
ANDOVER, MA 01810
(978) 975-2350
(Name, address, including zip code, and telephone number, including area code,
of agent for service)

COPIES TO:

MARK G. BORDEN, ESQ
HALE AND DORR LLP
60 STATE STREET
BOSTON, MASSACHUSETTS 02109
(617) 526-6000

APPROXIMATE DATE OF COMMENCEMENT OF PROPOSED SALE TO THE PUBLIC: As soon as
practicable after the effective date hereof.

If the only securities being registered on this form are being offered
pursuant to dividend or interest reinvestment plans, check the following box.

If any of the securities being registered on this Form are to be offered on
a delayed or continuous basis pursuant to Rule 415 under the Securities Act of
1933, other than securities offered only in connection with dividend or interest
reinvestment plans, 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.

If this Form is a post-effective amendment filed pursuant to Rule 462(c)
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.

If delivery of the prospectus is expected to be made pursuant to Rule 434,
please check the following box.

CALCULATION OF REGISTRATION FEE

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common stock previously registered under our registration statement on Form S-3 (File No. 333-34450) are being included in the prospectus included in this registration statement. A registration fee of \$44,976 has been paid previously with respect to such securities. The registration fee of \$9,916 relates solely to the registration of an additional 5,150,000 shares of common stock not previously registered.

WE HEREBY AMEND THIS REGISTRATION STATEMENT ON SUCH DATE OR DATES AS MAY BE NECESSARY TO DELAY ITS EFFECTIVE DATE UNTIL WE SHALL FILE A FURTHER AMENDMENT WHICH SPECIFICALLY STATES THAT THIS REGISTRATION STATEMENT SHALL THEREAFTER BECOME EFFECTIVE IN ACCORDANCE WITH SECTION 8(a) OF THE SECURITIES ACT OF 1933 OR UNTIL THE REGISTRATION STATEMENT SHALL BECOME EFFECTIVE ON SUCH DATE AS THE COMMISSION, ACTING PURSUANT TO SECTION 8(a), MAY DETERMINE.

STATEMENT PURSUANT TO RULE 429(b)

Pursuant to Rule 429 under the Securities Act, the prospectus included in this registration statement also relates to 3,450,000 shares of common stock previously registered but not sold under our registration statement on Form S-3 (File No. 333-34450), which became effective on July 24, 2000. This registration statement, which is a new registration statement, also constitutes post-effective amendment No. 2 to the registration statement on Form S-3 (File No. 333-34450) (the "Post-Effective Amendment"). Such Post-Effective Amendment shall hereafter become effective concurrently with the effectiveness of this registration statement and in accordance with Section 8(c) of, and Rule 429 under, the Securities Act. A registration fee of \$44,976 was paid in connection with the registration of the 3,450,000 shares of common stock previously registered under the registration statement on Form S-3 (File No. 333-34450), which remain eligible to be sold as of the date of the filing of this registration statement. The 3,450,000 shares of common stock registered on the registration statement on Form S-3 (File No. 333-34450) are hereby combined with the 5,150,000 shares of common stock registered pursuant to this registration statement to enable the offer and sale of an aggregate of 8,600,000 shares of common stock pursuant to the prospectus included in this registration statement.

THE INFORMATION IN THIS PROSPECTUS IS NOT COMPLETE AND MAY BE CHANGED. THESE SECURITIES MAY NOT BE SOLD UNTIL THE REGISTRATION STATEMENT FILED WITH THE SECURITIES AND EXCHANGE COMMISSION IS EFFECTIVE. THIS PROSPECTUS IS NOT AN OFFER TO SELL THESE SECURITIES AND IT IS NOT SOLICITING OFFERS TO BUY THESE SECURITIES IN ANY STATE WHERE THE OFFER OR SALE IS NOT PERMITTED.

SUBJECT TO COMPLETION, DATED OCTOBER 16, 2003

PROSPECTUS

8,600,000 SHARES

(MKS LOGO)

COMMON STOCK

We may, from time to time, issue up to 2,300,000 shares of common stock, and the selling stockholders may, from time to time, offer up to 6,300,000 shares of common stock. We will not receive any of the proceeds from the sale of shares by the selling stockholders.

We and the selling stockholders identified in this prospectus (or their pledges, donees, transferees or other successors-in-interest) may offer the shares from time to time through public or private transactions at prevailing market prices, at prices related to prevailing market prices or at privately negotiated prices.

Our common stock is traded on the Nasdaq National Market under the symbol "MKSI." The last reported sale price of our common stock on the Nasdaq National Market on October 14, 2003 was \$23.70 per share.

INVESTING IN OUR COMMON STOCK INVOLVES A HIGH DEGREE OF RISK. SEE "RISK FACTORS" BEGINNING ON PAGE 2.

NEITHER THE SECURITIES AND EXCHANGE COMMISSION NOR ANY STATE SECURITIES COMMISSION HAS APPROVED OR DISAPPROVED OF THESE SECURITIES OR DETERMINED IF THIS PROSPECTUS IS TRUTHFUL OR COMPLETE. ANY REPRESENTATION TO THE CONTRARY IS A CRIMINAL OFFENSE.

The date of this prospectus is _____, 2003

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YOU SHOULD RELY ONLY ON THE INFORMATION CONTAINED IN THIS PROSPECTUS. NEITHER WE NOR THE SELLING STOCKHOLDERS HAVE AUTHORIZED ANYONE TO PROVIDE YOU WITH INFORMATION DIFFERENT FROM THAT CONTAINED IN THIS PROSPECTUS. WE AND THE SELLING STOCKHOLDERS ARE OFFERING TO SELL, AND SEEKING OFFERS TO BUY, SHARES OF COMMON STOCK ONLY IN JURISDICTIONS WHERE OFFERS AND SALES ARE PERMITTED. THE INFORMATION CONTAINED IN THIS PROSPECTUS IS ACCURATE ONLY AS OF THE DATE OF THIS PROSPECTUS, REGARDLESS OF THE TIME OF DELIVERY OF THIS PROSPECTUS OR OF ANY SALE OF OUR COMMON STOCK. THE INFORMATION IN OUR INTERNET WEBSITE IS NOT INCORPORATED BY REFERENCE INTO THIS PROSPECTUS. IN THIS PROSPECTUS, "MKS," "WE," "US" AND "OUR" REFER TO MKS INSTRUMENTS, INC. (UNLESS THE CONTEXT OTHERWISE REQUIRES).

ABOUT THIS PROSPECTUS

This prospectus is part of a registration statement that we filed with the SEC utilizing a "shelf" registration process. Under this shelf process, we may sell up to a total of 2,300,000 shares of common stock in one or more offerings and the selling stockholders may sell up to a total of 6,300,000 shares of common stock in one or more offerings. We have provided to you in this prospectus a general description of the securities we and the selling stockholders may offer. Each time we or the selling stockholders sell securities, we will provide a prospectus supplement that will contain specific information about the terms of that offering. We may also add, update or change in the prospectus supplement any of the information contained in this prospectus. This prospectus, together with applicable prospectus supplements, will include all material information relating to such offering.

MKS INSTRUMENTS, INC.

We are a leading worldwide provider of instruments, components and subsystems that measure, control, power and monitor critical parameters of semiconductor and other advanced manufacturing process environments.

Our objective is to enable our customers to improve their manufacturing process productivity and yields. Our strategy is to develop and provide sensor and data management instruments, components and subsystems that control critical parameters of the process environment in which advanced materials are manufactured. We are undertaking this strategy by further developing our core technologies, acquiring complementary technologies, embedding process expertise into our products, and integrating our products into process management subsystems that "surround the process chamber."

We are organized into three product groups: Instruments and Control Systems; Power and Reactive Gas Products; and Vacuum Products. Our products are derived from our core competencies in pressure measurement and control; materials delivery; gas and thin-film composition analysis; control and information management; power and reactive gas generation; and vacuum technology.

Our products are used in diverse markets and applications including the manufacture of, among other things:

- semiconductor devices for diverse consumer electronics applications;
- flat panel displays for hand-held devices, laptop computers, desktop computer monitors and television sets;
- magnetic and optical storage media;
- optical filters and fiber optic cables for data and telecommunications;
- optical coatings for eyeglasses, architectural glass and solar panels;
- magnetic resonance imaging (MRI) medical equipment;
- gas lasers;
- cutting tools; and
- freeze-dried pharmaceuticals.

We are a Massachusetts corporation organized in June 1961. Our principal executive offices are located at Six Shattuck Road, Andover, MA 01810, and our telephone number is (978) 975-2350. Our web site is located at www.mksinst.com. The information on our Internet website is not incorporated by reference in this prospectus. Unless the context otherwise requires references in this prospectus to "MKS", "we," "us," and "our" refer to MKS Instruments, Inc.

RISK FACTORS

Investing in our securities involves risk. Please see the risk factors described in our Quarterly Report on Form 10-Q for the quarter ended June 30, 2003, which is incorporated by reference in this prospectus. Before making an investment decision, you should carefully consider these risks as well as other information we include or incorporate by reference in this prospectus. The risks and uncertainties not presently known to us or that we currently deem immaterial may also affect our business operations.

SPECIAL NOTE REGARDING FORWARD-LOOKING INFORMATION

This prospectus includes and incorporates forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended, and Section 21E of the Securities Exchange Act of 1934, as amended. All statements, other than statements of historical facts, included or incorporated in this prospectus regarding our strategy, future operations, financial position, future revenues, projected costs, prospects, plans and objectives of management are forward-looking statements. The words "anticipates," "believes," "estimates," "expects," "intends," "may," "plans," "potential," "projects," "will," "would" and similar expressions are intended to identify forward-looking statements, although not all forward-looking statements contain these identifying words. We cannot guarantee that we actually will achieve the plans, intentions or expectations disclosed in our forward-looking statements and you should not place undue reliance on our forward-looking statements. Actual results or events could differ materially from the plans, intentions and expectations disclosed in the forward-looking statements we make. We have included important factors in the cautionary statements included or incorporated in this prospectus, particularly under the heading "Risk Factors", that we believe could cause actual results or events to differ materially from the forward-looking statements that we make. Our forward-looking statements do not reflect the potential impact of any future acquisitions, mergers, dispositions, joint ventures or investments we may make. We do not assume any obligation to update any forward-looking statements.

USE OF PROCEEDS

Unless otherwise indicated in the accompanying prospectus supplement, we expect to use the net proceeds from the sale of any securities sold by us hereby for general corporate purposes, including working capital, product development and capital expenditures. A portion of such net proceeds may also be used for the acquisition of businesses, products and technologies that are complementary to ours. There are currently no commitments or agreements with respect to any such material acquisition. Pending such uses, we intend to invest any such net proceeds in investment-grade, interest-bearing securities.

We will not receive any of the proceeds from the sale of shares by the selling stockholders.

SELLING STOCKHOLDERS

The following table sets forth, to our knowledge, information about the selling stockholders as of September 1, 2003. As of September 1, 2003, we had 51,645,208 shares of common stock issued and outstanding. Beneficial ownership is determined in accordance with the rules of the SEC, and includes voting or investment power with respect to shares, as well as any shares as to which the selling stockholder has the right to acquire beneficial ownership within 60 days after September 1, 2003 through the exercise or conversion of any stock option or other right. Unless otherwise indicated below, to our knowledge, all selling stockholders named in the table have sole voting and investment power with respect to their shares of common stock, except to the extent authority is shared by spouses under applicable law. The inclusion of any shares in this table does not constitute an admission of beneficial ownership for the selling stockholder named below.

SHARES BENEFICIALLY OWNED PRIOR TO OFFERING(1)	NUMBER	NAME OF SELLING STOCKHOLDER	NUMBER	PERCENT SHARES OFFERED
-	-	John R. Bertucci	5,617,805(2)	10.9%
1,150,000	4,467,804	Claire R. Bertucci	5,377,927	10.4%
-	-	Emerson Electric Co.	12,000,000(3)	23.2%
-	-		4,000,000	8,000,000
-	-			14.8%

- (1) We do not know when or in what amounts a selling stockholder may offer shares for sale. The selling stockholders might not sell any or all of the shares offered by this prospectus. Because the selling stockholders may offer all or some of the shares pursuant to this prospectus, and because there are currently no agreements, arrangements or understandings with respect to the sale of any of the shares, we cannot estimate the number of the shares that will be held by the selling stockholders after completion of any offering. However, for purposes of this table, we have assumed that, after completion of the offering, all shares offered by us pursuant to this prospectus will be outstanding and none of the shares covered by this prospectus will be held by the selling stockholders.
- (2) Consists of 5,117,094 shares held directly by Mr. Bertucci, 4,710 shares held by a limited partnership, 462,259 shares held by trusts for which Mr. Bertucci serves as a co-trustee and 33,742 shares subject to options exercisable within 60 days of September 1, 2003.
- (3) Consists of (a) 3,036,611 shares held directly by Emerson Electric Co. and 963,389 shares held by Astec America Inc., a wholly owned subsidiary of Emerson Electric Co., all of which shares are covered by this prospectus and (b) 8,000,000 shares owned by Astec America Inc. not covered by this prospectus.

RELATIONSHIP WITH SELLING STOCKHOLDERS

Mr. Bertucci is the President, Chairman and Chief Executive Officer of MKS. Claire R. Bertucci is Mr. Bertucci's wife.

On January 31, 2002, we acquired the business of Emerson Electric Co. ("Emerson") and its subsidiaries operating as the "ENI Division" of Emerson, pursuant to an Agreement and Plan of Merger dated October 30, 2001 between

Emerson and us. The purchase price was approximately \$265,000,000, and included the issuance of an aggregate of 12,000,000 shares of our common stock to Emerson and its subsidiaries. During 2002, MKS purchased materials and services from Emerson and its subsidiaries totaling approximately \$1,156,000.

In connection with the acquisition of the ENI Division and pursuant to a Shareholders Agreement with Emerson, we agreed to elect, and, pursuant to a Voting Agreement, Mr. and Mrs. Bertucci and certain of their affiliates and designees agreed to vote their shares to elect, a designee of Emerson to our Board of Directors until such time as Emerson owns less than 12.5% of our outstanding shares. Accordingly, upon the closing of the acquisition, we elected James G. Berges to our Board of Directors. Mr. Berges is currently President and a director of Emerson.

Pursuant to the Shareholders Agreement between Emerson and us, we have granted Emerson the right to require us to file a registration statement under the Securities Act of 1933, covering resales of all shares of

common stock held by Emerson and its subsidiaries. The Shareholders Agreement also grants "piggy-back" registration rights to Emerson, permitting it to include its shares of common stock in a registration of securities by us. The Shareholders Agreement also obligates us to pay the expenses of these registrations.

PLAN OF DISTRIBUTION

The securities being offered hereby may be sold in one or more of the following ways from time to time:

- through agents to the public or to investors;
- to underwriters for resale to the public or to investors; or
- directly to investors.

We will set forth in a prospectus supplement the terms of the offering of securities, including:

- the name or names of any agents or underwriters;
- the purchase price of the securities being offered and the proceeds we will receive from the sale;
- any over-allotment options under which underwriters may purchase additional securities from us;
- any agency fees or underwriting discounts and other items constituting agents' or underwriters' compensation;
- any public offering price; and
- any discounts or concessions allowed or reallocated or paid to dealers.

In addition, any shares that qualify for sale pursuant to Rule 144 may be sold under Rule 144 rather than pursuant to this prospectus.

AGENTS

We and the selling stockholders may designate agents who agree to use their reasonable efforts to solicit purchases for the period of their appointment or to sell securities on a continuing basis.

UNDERWRITERS

If we and the selling stockholders use underwriters for a sale of securities, the underwriters will acquire the securities for their own account. The underwriters may resell the securities in one or more transactions, including negotiated transactions, at a fixed public offering price or at varying prices determined at the time of sale. The obligations of the underwriters to purchase the securities will be subject to the conditions set forth in the applicable underwriting agreement. Any public offering price and any discounts or concessions allowed or paid to dealers may be changed from time to time. We may use underwriters with whom we have a material relationship. We will describe in any prospectus supplement which names the underwriter the nature of any such relationship.

DIRECT SALES

We and the selling stockholders may also sell securities directly to one or more purchasers without using underwriters or agents.

The selling stockholders may sell securities through a broker-dealer as principal and resale by such broker-dealer for its own account pursuant to this prospectus, or through block trades in which the broker-dealer so engaged will attempt to sell the shares as agent but may position and resell a portion of the block as principal to facilitate the transaction.

Underwriters, dealers and agents that participate in the distribution of the securities may be underwriters as defined in the Securities Act and any discounts or commissions they receive from us and any profit on their resale of the securities may be treated as underwriting discounts and commissions under the Securities Act.

We will identify in the applicable prospectus supplement any underwriters, dealers or agents and will describe their compensation. We may have agreements with the underwriters, dealers and agents to indemnify them against specified civil liabilities, including liabilities under the Securities Act. Underwriters, dealers and agents may engage in transactions with or perform services for us or our subsidiaries in the ordinary course of their businesses.

TRADING MARKETS

In connection with an offering, an underwriter may purchase and sell securities in the open market. These transactions may include short sales, stabilizing transactions and purchases to cover positions created by short sales. Short sales involve the sale by the underwriters of a greater number of securities than they are required to purchase in the offering. "Covered" short sales are sales made in an amount not greater than the underwriters' option to purchase additional securities from the Company in the offering, if any. If the underwriters have an over-allotment option to purchase additional securities from the Company, the underwriters may close out any covered short position by either exercising their over-allotment option or purchasing securities in the open market. In determining the source of securities to close out the covered short position, the underwriters may consider, among other things, the price of securities available for purchase in the open market as compared to the price at which they may purchase securities through the over-allotment option. "Naked" short sales are any sales in excess of such option or where the underwriters do not have an over-allotment option. The underwriters must close out any naked short position by purchasing securities in the open market. A naked short position is more likely to be created if the underwriters are concerned that there may be downward pressure on the price of the securities in the open market after pricing that could adversely affect investors who purchase in the offering.

Accordingly, to cover these short sales positions or to otherwise stabilize or maintain the price of the securities, the underwriters may bid for or purchase securities in the open market and may impose penalty bids. If penalty bids are imposed, selling concessions allowed to syndicate members or other broker-dealers participating in the offering are reclaimed if securities previously distributed in the offering are repurchased, whether in connection with stabilization transactions or otherwise. The effect of these transactions may be to stabilize or maintain the market price of the securities at a level above that which might otherwise prevail in the open market. The imposition of a penalty bid may also effect the price of the securities to the extent that it discourages resale of the securities. The magnitude or effect of any stabilization or other transactions is uncertain. These transactions may be effected on the Nasdaq National Market or otherwise and, if commenced, may be discontinued at any time.

VALIDITY OF COMMON STOCK

The validity of the common stock offered hereby will be passed upon for us by Hale and Dorr LLP, Boston, Massachusetts.

EXPERTS

The financial statements of MKS Instruments, Inc. incorporated in this prospectus by reference to the Annual Report on Form 10-K for the year ended December 31, 2002 have been so incorporated in reliance on the report of PricewaterhouseCoopers LLP, independent accountants, and, in so far as they relate to the consolidated statement of operations, stockholders' equity and cash flows of Applied Science and Technology, Inc. and its subsidiaries for the year ended July 1, 2000 on the report of KPMG LLP, independent accountants. Such financial statements have been so incorporated in reliance on the reports of such independent accountants given on the authority of said firms as experts in auditing and accounting.

WHERE YOU CAN FIND MORE INFORMATION

We file reports, proxy statements and other documents with the Securities and Exchange Commission. You may read and copy any document we file at the SEC's public reference room at Judiciary Plaza Building,

450 Fifth Street, N.W., Room 1024, Washington, D.C. 20549. You should call 1-800-SEC-0330 for more information on the public reference room. Our SEC filings are also available to you on the SEC's Internet site at <http://www.sec.gov>.

This prospectus is part of a registration statement that we filed with the SEC. The registration statement contains more information than this prospectus regarding us and our common stock, including certain exhibits and schedules. You can obtain a copy of the registration statement from the SEC at the address listed above or from the SEC's Internet site.

INCORPORATION OF CERTAIN DOCUMENTS BY REFERENCE

The SEC allows us to "incorporate" into this prospectus information that we file with the SEC in other documents. This means that we can disclose important information to you by referring to other documents that contain that information. The information incorporated by reference is considered to be part of this prospectus. Information contained in this prospectus and information that we file with the SEC in the future and incorporate by reference in this prospectus automatically updates and supersedes previously filed information. We incorporate by reference the documents listed below and any future filings we make with the SEC under Sections 13(a), 13(c), 14 or 15(d) of the Securities Exchange Act of 1934, prior to the sale of all the shares covered by this prospectus.

1. Our Annual Report on Form 10-K for the fiscal year ended December 31, 2002;
2. Our Quarterly Report on Form 10-Q for the fiscal quarter ended March 31, 2003;
3. Our Quarterly Report on Form 10-Q for the fiscal quarter ended June 30, 2003;
4. Our Current Report on Form 8-K filed with the SEC on October 16, 2003;
5. All of our filings pursuant to the Exchange Act after the date of filing the initial registration statement and prior to effectiveness of the registration statement; and
6. The description of our common stock contained in our Registration Statement on Form 8-A dated March 2, 1999.

You may request a copy of these documents, which will be provided to you at no cost, by writing or telephoning us using the following contact information:

MKS Instruments, Inc.
Six Shattuck Road
Andover, MA 01810
Attention: Chief Financial Officer
Telephone: (978) 975-2350

PART II

INFORMATION NOT REQUIRED IN PROSPECTUS

ITEM 14. OTHER EXPENSES OF ISSUANCE AND DISTRIBUTION

Estimated expenses payable in connection with the sale of the common stock offered hereby are as follows:

SEC Registration Fee.....	\$ 9,412
Printing, Engraving and Mailing Expenses.....	\$ 60,000
Legal Fees and Expenses.....	\$ 75,000
Accounting Fees and Expenses.....	\$ 60,000
Transfer Agent and Registrar Fees.....	\$ 25,000
Miscellaneous.....	\$ 20,588

Total.....	\$250,000
	=====

We have agreed, pursuant to a Shareholder Agreement between us and Emerson, dated as of January 1, 2002, to bear the expenses relating to the registration of shares issued to Emerson in connection with the acquisition of the ENI Division. Accordingly, we will pay that percentage of the expenses listed above that is equal to the pro rata portion that the aggregate number of shares that are offered by us and by Emerson pursuant to this registration statement bears to the total number of shares that are offered hereunder. Mr. and Mrs. Bertucci will bear that percentage of the expenses listed above that is equal to the pro rata portion that the aggregate number of shares that are offered by them bears to the total number of shares offered hereunder. In the event that no shares are offered by us or the selling stockholders pursuant to this registration statement, then we will bear all of the costs listed above.

ITEM 15. INDEMNIFICATION OF DIRECTORS AND OFFICERS

Section 67 of Chapter 156B of the Massachusetts General Laws provides that a corporation may indemnify its directors and officers to the extent specified in or authorized by (1) the articles of organization; (2) a by-law adopted by the stockholders; or (3) a vote adopted by the holders of a majority of the shares of stock entitled to vote on the election of directors. In all instances, the extent to which a corporation provides indemnification to its directors and officers under Section 67 is optional. In its Amended and Restated Articles of Organization (the "Articles of Organization"), the Registrant has elected to commit to provide indemnification to its directors and officers in specified circumstances. Generally, Article 6 of the Registrant's Articles of Organization provides that the Registrant shall indemnify directors and officers of the Registrant against liabilities and expenses arising out of legal proceedings brought against them by reason of their status as directors or officers or by reason of their agreeing to serve, at the request of the Registrant, as a director or officer of another organization. Under this provision, a director or officer of the Registrant shall be indemnified by the Registrant for all costs and expenses (including attorneys' fees), judgments, liabilities and amounts paid in settlement of such proceedings, even if he is not successful on the merits, if he acted in good faith in the reasonable belief that his action was in the best interests of the Registrant. The Board of Directors may authorize advancing litigation expenses to a director or officer at his request upon receipt of an undertaking by any such director or officer to repay such expenses if it is ultimately determined that he is not entitled to indemnification for such expenses.

Article 6 of the Registrant's Articles of Organization eliminates the personal liability of the Registrant's directors to the Registrant or its stockholders for monetary damages for breach of a director's fiduciary duty, except to the extent Chapter 156B of the Massachusetts General Laws prohibits the elimination or limitation of such liability.

The Company has obtained directors and officers liability insurance for the benefit of its directors and certain of its officers.

ITEM 16. EXHIBITS AND FINANCIAL STATEMENT SCHEDULES

(a) Exhibits:

EXHIBIT NO.

DESCRIPTION - -----
----- 1.1 The form of underwriting agreement will be filed as an exhibit to a Current Report on Form 8-K of the Registrant and incorporated herein by reference. 3.1(1) Restated Articles of Organization, as filed with the Secretary of State of Massachusetts 3.2(2) Articles of Amendment, as filed with the Secretary of State of Massachusetts on May 18, 2001 3.3(3) Articles of Amendment, as filed with the Secretary of State of Massachusetts on May 16, 2002 3.5(4) Amended and Restated By-Laws 4.1(4) Specimen certificate representing the common stock 4.2(5) Shareholder Agreement dated as of January 1, 2002 among the Registrant and Emerson Electric Co. 5.1 Opinion of Hale and Dorr LLP 23.1 Consent of Hale and Dorr LLP (contained in Exhibit 5.1) 23.2 Consent of PricewaterhouseCoopers LLP 23.3 Consent of KPMG LLP 24 Power of Attorney (included on Page II-4)

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- (1) Incorporated by reference to the Registration Statement on Form S-4 (File No. 333-49738) filed with the Securities and Exchange Commission on November 13, 2000.
- (2) Incorporated by reference to the Registrant's Quarterly Report on Form 10-Q (File No. 000-23621) for the quarter ended June 30, 2001.
- (3) Incorporated by reference to the Registrant's Quarterly Report on Form 10-Q (File No. 000-23621) for the quarter ended June 30, 2002.
- (4) Incorporated by reference to the Registration Statement on Form S-1 (File No. 333-71363) filed with the Securities and Exchange Commission on January 28, 1999, as amended.
- (5) Incorporated by reference to the Current Report on Form 8-K filed with the Securities and Exchange Commission on February 12, 2002.

(b) Financial Statements Schedules

See Item 15(a)(2) to our Annual Report on Form 10-K for the year ended December 31, 2002, which is incorporated by reference into this registration

statement.

ITEM 17. UNDERTAKINGS

The undersigned registrant hereby undertakes:

(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, as amended (the "Securities 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. Notwithstanding the foregoing, any increase or decrease in the volume of securities offered (if the total dollar value of securities offered would not exceed that which was registered) and any deviation from the low or high end of the estimated maximum offering range may be reflected in the form of prospectus filed with the Securities and Exchange Commission pursuant to

Rule 424(b) if, in the aggregate, the changes in volume and price represent no more than 20 percent change in the maximum aggregate offering price set forth in the "Calculation of Registration Fee" table in the effective 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 paragraphs (1)(i) and (1)(ii) do not apply if the information required to be included in a post-effective amendment by those paragraphs is contained in periodic reports filed with or furnished to the Securities and Exchange Commission by the registrant pursuant to Section 13 or Section 15(d) of the Securities Exchange Act of 1934, as amended (the "Exchange Act") that are incorporated by reference in this registration statement.

(2) That, for the purpose of determining any liability under the Securities Act, each 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 the time shall be deemed to be the initial bona fide offering thereof.

(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.

The registrant hereby undertakes that, for purposes of determining any liability under the Securities Act, each filing of the registrant's annual report pursuant to Section 13(a) or 15(d) of the Exchange Act (and, where applicable, each filing of an employee benefit plan's annual report pursuant to Section 15(d) of the Exchange Act) that is incorporated by reference in 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 the time shall be deemed to be the initial bona fide offering thereof.

Insofar as indemnification for liabilities arising under the Securities Act may be permitted to directors, officers and controlling persons of the registrant pursuant to the foregoing provisions, or otherwise, the registrant has been advised that in the opinion of the Securities and Exchange Commission such indemnification is against public policy as expressed in the Securities 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 Securities Act and will be governed by the final adjudication of such issue.

The undersigned registrant hereby undertakes that:

(1) For purposes of determining any liability under the Securities Act, the information omitted from the form of prospectus filed as part of this registration statement in reliance upon Rule 430A and contained in the form of prospectus filed by the registrant pursuant to Rule 424(b)(1) or (4) or 497(h) under the Securities Act shall be deemed to be part of this registration statement as of the time it was declared effective.

(2) For the purpose of determining any liability under the Securities Act, each post-effective amendment that contains a form of prospectus 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.

SIGNATURES

Pursuant to the requirements of the Securities Act of 1933, the Registrant certifies that it has reasonable grounds to believe that it meets all of the requirements for filing on Form S-3 and has duly caused this Registration Statement to be signed on its behalf by the undersigned, thereunto duly authorized, in the town of Andover, Commonwealth of Massachusetts, on this 16th day of October, 2003.

MKS INSTRUMENTS, INC.

By: /s/ JOHN R. BERTUCCI

John R. Bertucci
President, Chairman of the Board
and Chief Executive Officer

SIGNATURES AND POWER OF ATTORNEY

We, the undersigned officers and directors of MKS Instruments, Inc., hereby severally constitute and appoint John R. Bertucci, Ronald C. Weigner and Mark G. Borden, and each of them singly, our true and lawful attorneys with full power to any of them, and to each of them singly, to sign for us and in our names in the capacities indicated below the Registration Statement on Form S-3 filed herewith and any and all pre-effective and post-effective amendments to said Registration Statement and generally to do all such things in our name and behalf in our capacities as officers and directors to enable MKS Instruments, Inc. to comply with the provisions of the Securities Act of 1933, as amended, and all requirements of the Securities and Exchange Commission, hereby ratifying and confirming our signatures as they may be signed by our said attorneys, or any of them, to said Registration Statement and any and all amendments thereto.

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.

SIGNATURES

TITLE DATE

/s/ JOHN

R.

BERTUCCI

President,

Chairman

of the

Board

October

16, 2003 -

and Chief

Executive

Officer

John R.

Bertucci

(Principal

Executive

Officer)

/s/ RONALD

C. WEIGNER

Vice

President

and Chief

October

16, 2003 -

Financial

Officer

(Principal

Ronald C.

Weigner

Financial

and
Accounting
Officer)
/s/ ROBERT
R.
ANDERSON
Director
October
16, 2003 -

Robert R.
Anderson
/s/ JAMES
G. BERGES
Director
October
16, 2003 -

James G.
Berges /s/
RICHARD S.
CHUTE
Director
October
16, 2003 -

Richard S.
Chute /s/
HANS-
JOCHEN
KAHL
Director
October
16, 2003 -

Hans-
Jochen
Kahl

EXHIBIT INDEX

EXHIBIT NO.

DESCRIPTION - -----

----- 1.1 The form of underwriting agreement will be filed as an exhibit to a Current Report on Form 8-K of the Registrant and incorporated herein by reference. 3.1(1) Restated Articles of Organization, as filed with the Secretary of State of Massachusetts 3.2(2) Articles of Amendment, as filed with the Secretary of State of Massachusetts on May 18, 2001 3.3(3) Articles of Amendment, as filed with the Secretary of State of Massachusetts on May 16, 2002 3.5(4) Amended and Restated By-Laws 4.1(4) Specimen certificate representing the common stock 4.2(5) Shareholder Agreement dated as of January 1, 2002 among the Registrant and Emerson Electric Co. 5.1 Opinion of Hale and Dorr LLP 23.1 Consent of Hale and Dorr LLP (contained in Exhibit 5.1) 23.2 Consent of PricewaterhouseCoopers LLP 23.3 Consent of KPMG LLP 24 Power of Attorney (included on Page II-4)

- (1) Incorporated by reference to the Registration Statement on Form S-4 (File No. 333-49738) filed with the Securities and Exchange Commission on November 13, 2000.
- (2) Incorporated by reference to the Registrant's Quarterly Report on Form 10-Q (File No. 000-23621) for the quarter ended June 30, 2001.
- (3) Incorporated by reference to the Registrant's Quarterly Report on Form 10-Q (File No. 000-23621) for the quarter ended June 30, 2002.
- (4) Incorporated by reference to the Registration Statement on Form S-1 (File No. 333-71363) filed with the Securities and Exchange Commission on January 28, 1999, as amended.
- (5) Incorporated by reference to the Current Report on Form 8-K filed with the Securities and Exchange Commission on February 12, 2002.

[HALE AND DORR LLP LETTERHEAD]

HALEDORR.COM
60 STATE STREET - BOSTON, MA 02109
617-526-6000 - fax 617-526-5000

October 15, 2003

MKS Instruments, Inc.
Six Shattuck Road
Andover, MA 01810
Attention: President

Re: Registration Statement on Form S-3

Ladies and Gentlemen:

This opinion is furnished to you in connection with a Registration Statement on Form S-3 (the "Registration Statement") to be filed with the Securities and Exchange Commission (the "Commission") under the Securities Act of 1933, as amended (the "Securities Act"), for the registration of an aggregate of 5,150,000 shares of Common Stock, no par value per share (the "Shares"), of MKS Instruments, Inc., a Massachusetts corporation (the "Company"), all of which may be offered from time to time on a delayed or continuous basis pursuant to Rule 415 under the Securities Act. Of the Shares, 1,150,000 shares are being registered on behalf of the Company (the "Company Shares") and 4,000,000 shares are being registered on behalf of certain stockholders (the "Selling Stockholders") of the Company (the "Selling Stockholder Shares").

We are acting as counsel for the Company in connection with the registration for resale of the Shares. We have examined signed copies of the Registration Statement to be filed with the Commission. We have also examined and relied upon minutes of meetings of the stockholders and the Board of Directors of the Company as provided to us by the Company, stock record books of the Company as provided to us by the Company, the Articles of Organization and By-Laws of the Company, each as restated and/or amended to date, and such other documents as we have deemed necessary for purposes of rendering the opinions hereinafter set forth.

In our examination of the foregoing documents, we have assumed the genuineness of all signatures, the authenticity of all documents submitted to us as originals, the conformity to original documents of all documents submitted to us as copies, the authenticity of the originals of such latter documents and the legal competence of all signatories to such documents.

Our opinion in paragraph 2 below, insofar as it relates to the Selling Stockholder Shares being fully paid, is based solely on a certificate of the Chief Financial Officer of the Company confirming the Company's receipt of the consideration called for by the applicable resolutions authorizing the issuance of such shares.

We assume that the appropriate action will be taken, prior to the offer and sale of the Shares, to register and qualify the Shares for sale under all applicable state securities or "blue sky" laws.

We express no opinion herein as to the laws of any state or jurisdiction other than the state laws of the Commonwealth of Massachusetts and the federal laws of the United States of America.

Based upon and subject to the foregoing, we are of the opinion that:

1. With respect to the Company Shares, when (i) the Company Shares are specifically authorized for issuance by the Company's Board of Directors or an authorized committee thereof (the "Authorizing Votes"), (ii) the Registration Statement has become effective under the Securities Act, (iii) the terms of the sale of the Company Shares have been duly established in conformity with the Company's Articles of Organization and By-laws, each as restated and/or amended to date, and assuming such terms and sale do not violate any applicable law or result in a default under or breach of any agreement or instrument binding on the Company and comply with any requirement or restriction imposed by any court or governmental body having jurisdiction over the Company, (iv) the Company Shares have been issued and sold as contemplated by the Registration Statement, and (v) the Company has received the consideration provided for in the Authorizing Votes and such consideration per share is not less than the par value per share of the Company's Common Stock, the Company Shares will be duly authorized, validly issued, fully paid and nonassessable.

2. The Selling Stockholder Shares have been duly authorized and are validly issued, fully paid and nonassessable.

It is understood that this opinion is to be used only in connection with the offer and sale of the Shares while the Registration Statement is in effect.

Please note that we are opining only as to the matters expressly set forth herein, and no opinion should be inferred as to any other matters. This opinion is based upon currently existing statutes, rules, regulations and judicial decisions, and we disclaim any obligation to advise you of any change in any of these sources of law or subsequent legal or factual developments which might affect any matters or opinions set forth herein.

We hereby consent to the filing of this opinion with the Commission as an exhibit to the Registration Statement in accordance with the requirements of Item 601(b)(5) of Regulation S-K under the Securities Act and to the use of our name therein and in the related prospectus under the caption "Legal Matters." In giving such consent, we do not hereby 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.

Very truly yours,

/S/ HALE AND DORR LLP

HALE AND DORR LLP

CONSENT OF INDEPENDENT ACCOUNTANTS

We hereby consent to the incorporation by reference in this Registration Statement on Form S-3 and in the Registration Statement on Form S-3 No. 333-34450 Amendment No. 2 of our report dated February 3, 2003 relating to the financial statements and financial statement schedule of MKS Instruments, Inc., which appears in MKS Instruments, Inc.'s Annual Report on Form 10-K for the year ended December 31, 2002. We also consent to the reference to us under the heading "Experts" in such Registration Statements.

/s/ PricewaterhouseCoopers LLP

Boston, Massachusetts
October 10, 2003

INDEPENDENT AUDITORS' CONSENT

The Board of Directors
Applied Science and Technology, Inc and Subsidiaries:

We consent to the use of our report dated July 31, 2000, with respect to the consolidated statements of operations, stockholders' equity, and cash flows for the year ended July 1, 2000, incorporated herein by reference and to the reference to our firm under the heading "Experts" in MKS Instrument Inc.'s Form S-3, dated October 16, 2003.

/s/ KPMG LLP

Boston, MA
October 10, 2003