

(Rev. 6-93)
OMB No. 0651-001 (exp. 4/94)
Tab setting: ⇨ ⇨ ⇨ ⇨



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To the Honorable Commissioner of Patents

d original documents or copy thereof.

1. Name of conveying party(ies):

2. Name and address of receiving party(ies):

On-Line Technologies, Inc.
87 Church Street
East Hartford, Connecticut 06108

Name: MKS Instruments, Inc.

Internal Address: _____

Street Address: Six Shattuck Road

City: Andover State: MA ZIP: 01810

- Individual(s) Association
- General Partnership Limited Partnership
- Corporation-Connecticut
- Other _____

- Individual(s) citizenship _____
- Association _____
- General Partnership _____
- Limited Partnership _____
- Corporation-State Massachusetts
- Other _____

Additional name(s) of conveying party(ies) attached? Yes No

If assignee is not domiciled in the United States, a domestic representative designation is attached: Yes No

3. Nature of conveyance:

- Assignment Merger
- Security Agreement Change of Name
- Other _____

(Designations must be a separate document from assignment)
Additional name(s) & address(es) attached? Yes No

Execution Date: October 31, 2001

4. Application number(s) or trademark number(s):

A. Trademark Application No.(s)
76/128400

B. Trademark Registration No.(s)

Additional numbers attached? Yes No

5. Name and address of party to whom correspondence concerning document should be mailed:

Name: Ayla A. Lari

Internal Address: Hale and Dorr LLP

Street Address: 60 State Street

City: Boston State: MA ZIP: 02109

6. Total number of applications and registration involved: 1

7. Total fee (37 CFR 3.41).....\$ 40.00

- Enclosed
- Authorized to be charged to deposit account
Charge any additional fees associated with this paper or during the pendency of this application, or credit any overpayment, to deposit account.

8. Deposit account number:

08-0219

(Attach duplicate copy of this page if paying by deposit account)

DO NOT USE THIS SPACE

9. Statement and signature.

To the best of my knowledge and belief, the foregoing information is true and correct and any attached copy is a true copy of the original document.

Ayla A. Lari
Name of Person Signing

Ayla A. Lari
Signature

June 13, 2002
Date

Total number of pages including cover sheet, attachments, and document: 13

Mail documents to be recorded with required cover sheet information to:
Commissioner of Patents & Trademarks, Box Assignments
Washington, D.C. 20231

06/26/2002 6TOM11 00000242 080219 76128400
01 FC:481 40.00 CH

The Commonwealth of Massachusetts

Examiner

William Francis Galvin
Secretary of the Commonwealth
One Ashburton Place, Boston, Massachusetts 02108-1512

ARTICLES OF MERGER OF PARENT AND SUBSIDIARY CORPORATIONS (General Laws, Chapter 156B, Section 82)

We, Peter R. Younger, *President / ~~XXXXXXXXXX~~

and Richard S. Chute, *Clerk / ~~XXXXXXXXXX~~

of MKS Instruments, Inc.
(Exact name of corporation)

organized under the laws of Massachusetts and herein called the parent corporation
certify as follows:

1. That the subsidiary corporation(s) to be merged into the parent corporation is/are:

NAME	STATE OF ORGANIZATION	DATE OF ORGANIZATION
On-Line Technologies, Inc.	Connecticut	December 12, 1991

2. The parent corporation, at the date of the vote, owned not less than ninety percent (90%) of the outstanding shares of each class of stock of the subsidiary corporation or corporations with which it has voted to merge.

Item 3 below may be deleted if all the corporations are organized under the laws of Massachusetts and if General Laws, Chapter 156B is applicable to them.

3. That in the case of each of the above named corporations, the laws of the state of its organization, if other than Massachusetts, permit the merger herein described, and that all action required under the laws of each such state in connection with this merger has been duly taken.

Delete the inapplicable words. In case the parent corporation is organized under the laws of a state other than Massachusetts, articles are to be signed by officers having corresponding powers and duties.

01 OCT 31 1991
CORPORATION DIVISION

4. That at a meeting of the directors of the parent corporation, the following vote, pursuant to General Laws, Chapter 156B, Section 82, Subsection (a) was duly adopted:

See Attachment 1

Note: Votes, for which the space provided above is not sufficient, should be listed on additional sheets to be numbered 4A, 4B, etc. Additional sheets must be 8 1/2 x 11 and have a left hand margin of 1 inch. Only one side should be used.

TRADEMARK
REEL: 2532 FRAME: 0405

MKS INSTRUMENTS, INC.

Votes of the Board of Directors

VOTED: That, pursuant to Section 82 of Chapter 156B of the Massachusetts General Laws, and Section 33-818 of the Connecticut General Statutes, the Corporation is hereby authorized to merge On-Line Technologies, Inc., a Connecticut corporation and wholly owned subsidiary of the Corporation, into the Corporation (the "Merger");

FURTHER
VOTED: That the Plan of Merger, substantially in the form attached hereto as Exhibit A, is hereby approved and adopted with any such changes as the President or any Vice President shall deem necessary or appropriate.

FURTHER
VOTED: That the President or any Vice President and Clerk of the Corporation be, and each hereby is, authorized to execute (i) the Articles of Merger with respect to the Merger and to cause the same to be filed with the Secretary of State of Massachusetts and (ii) the Certificate of Merger with respect to the Merger and to cause the same to be filed with the Secretary of State of Connecticut, and to take all such other actions, and all such other actions that have been taken are hereby ratified, and to execute all such other instruments and agreements as they or any of them deem appropriate to effect such Merger;

FURTHER
VOTED: That the Merger shall be effective upon the completion of the filing of the Certificate of Merger with the Secretary of State of Connecticut and the Articles of Merger with the Secretary of State of Massachusetts;

FURTHER
VOTED: That each of the appropriate officers of the Corporation be, and hereby singly is, authorized to take such action as shall be required to evidence approval and ratification by the Corporation of the Merger;

PLAN OF MERGER

PLAN OF MERGER, dated this 15th day of October, 2001, pursuant to Section 82 of Chapter 156B of the Massachusetts General Laws and Section 33-818 of the Connecticut General Statutes.

1. **Merger.** On-Line Technologies, Inc., a Connecticut corporation having its principal place of business at 87 Church Street, East Hartford, CT 06108 (the "Company") is a wholly owned subsidiary of MKS Instruments, Inc., a Massachusetts corporation having its principal place of business at Six Shattuck Road, Andover, MA 01810 (the "Surviving Company"). The Company shall be merged into the Surviving Company pursuant to Section 82 of Chapter 156B of the Massachusetts General Laws and Section 33-818 of the Connecticut General Statutes. The Surviving Company shall survive the merger herein contemplated and shall continue to be governed by the laws of the Commonwealth of Massachusetts. The separate corporate existence of the Company shall cease forthwith upon the Effective Date (as defined below). The merger of the Company into the Surviving Company shall herein be referred to as the "Merger."

2. **Effective Date.** The Merger shall be effective upon the filing of the Articles of Merger with the Secretary of State of the Commonwealth of Massachusetts and the Certificate of Merger with the Secretary of State of the State of Connecticut. The time of such effectiveness shall herein be referred to as the "Effective Date."

3. **Common Stock of the Company.** On the Effective Date, by virtue of the Merger and without any action on the part of the holder thereof, each share of Common Stock of the Company issued and outstanding immediately prior thereto shall cease to exist.

4. **Common Stock of the Surviving Company.** On the Effective Date, by virtue of the Merger and without any action on the part of the holder thereof, each share of Common Stock of the Surviving Company issued and outstanding immediately prior thereto shall remain issued and outstanding and each share of Common Stock of the Surviving Company held in the treasury of the Surviving Company immediately prior thereto shall remain in the treasury.

5. **Abandonment.** At any time prior to the Effective Date, this Plan of Merger may be terminated and the Merger may be abandoned by the Board of Directors of the Surviving Company.

Adopted by the Board of Directors
of MKS Instruments, Inc. on October 15, 2001

Section 2.12: Real Property Leases

The Company currently leases and occupies space located in 87 Church Street, East Hartford, Connecticut 06108, pursuant to the Lease Agreement executed by and between the Company and Rudolph J. Danowski and George J. Grosner, dated June 1, 1997. The leased premises consists of approximately 6,860 square feet of space. The Company currently pays a total base rent of \$3,045.84 per month. Beginning June 1, 2001 and continuing until the end of the lease term, the Company will pay a total base rent of \$3,565.41 per month. This lease is for a term of 5 years and is scheduled to terminate on May 31, 2002. Upon expiration, the Company has an option to renew the lease for an additional 5 years. The Company verbally requested that the landlord build out an additional 3,000 square feet of space, with regard to which the Company will enter into a lease at the same per-square-foot price as under the existing lease. The property is currently mortgaged.

The Company additionally subleases approximately 4,179 square feet of space from Advanced Fuel Research, Inc. ("AFR") at 87 Church Street, East Hartford, Connecticut, pursuant to an oral sublease, which will be in writing prior to the Closing in a form reasonably acceptable to the Buyer. AFR currently leases such space from Rudolph J. Danowski and George J. Grosner for a term of five (5) years ending on September 30, 2005. The Company currently pays \$25,000 per year in rent to AFR.

Section 2.13: Intellectual Property

(a) The following charts list all patents, patent applications, copyright registrations or applications, mask work registrations or applications, and trademark, service mark and domain name registration or application:

Patents, Patents Pending and Patents in Preparation

<u>U.S. Patents</u>	<u>Issue Date</u>	<u>Title</u>
4,652,755 *	3/24/87	Method and Apparatus for Analyzing Particle-Containing Gaseous Suspensions: <u>APPLICATIONS</u> -This patent covers the methodology for in-site analysis of hot reactive gas mixtures which contain particles. The method provides data on gas composition and temperature, as well as particle sizes, concentration and temperature. It has been applied to measure coal combustion and black liquor combustion. It is a broad fundamental patent with application to <u>FUTURE GAS ANALYSIS PRODUCTS</u> .
4,985,858 *	1/15/91	Method and Apparatus for Temperature Determination: <u>APPLICATIONS</u> - This patent covers a unique method employing the Christiansen dip for measuring the surface temperature of glass, ceramics and other dielectrics. It provides a very accurate, non contact method

		which does not require prior knowledge of the emissivity. It is particularly useful in situations where there is stray radiation. It will have application for the in-situ measurement of dielectric coatings in semiconductor fabrication for <u>FUTURE PROCESS ANALYSIS PRODUCTS</u> .
4,824,790 *	4/25/89	System and Method for Thermogravimetric Analysis: <u>SENSOR</u> – This patent covers a method to couple a thermogravimetric analysis (TGA) apparatus with an FTIR to analyze evolved products. It permits an analysis of the tars which are often produced with hydrocarbons so that a complete material balance can be obtained. It has application outside the semiconductor industry for <u>ANALYTICAL INSTRUMENTATION</u> .
5,136,154	8/4/92	Method and System for Photoconductive Detector Signal Correction: <u>FTIR</u> – An important patent for all of FTIR-based products using photoconductive detectors such as MCT. It linearizes the detector so that the measurements from all instruments are identical. This is essential for quantitative analysis. It has application in <u>CURRENT WAFER AND GAS ANALYSIS PRODUCTS</u> .
5,170,223 *	12/8/92	Device for Blocking of Divergent Radiation as in Spectroscopy and Instrument and Method Utilizing Same: <u>SENSOR</u> – This patent allows the Bomem FTIR or an FTIR with a similar interferometer to operate simultaneously in the emission and transmission mode.
5,196,902 ¹	3/23/93	Two-Beam Interferometer Apparatus and Method, and Spectrometer and Instrument Utilizing the Same: <u>FTIR</u> – This patent covers some of the original unique features of our original prototypes. It has been superseded by subsequent patents.
5,239,488	8/24/93	Apparatus and Method for Determining High Temperature Surface Emissivity Through Reflectance and Radiance Measurements: <u>SENSOR</u> – This patent covers a method to simultaneously measure the emissivity and temperature of a surface. It is the basis for a new ASTM method and for the Company. <u>HIGH TEMPERATURE EMISSOMETER</u> .
5,285,167	2/8/94	Method and Apparatus for Signal Compression: <u>FTIR</u> – This patent covers methods for improving the dynamic range of the A to D converter in the FTIR electronics. It is not presently used in our products.
5,349,438 *	9/20/94	Structure for the Dynamic Support of a Reflective Element and Interferometer Comprising the Same: <u>FTIR</u> – This patent covers the Company's unique mirror translation system, which provides isolation from translational and rotational vibrations and the cross spring pivot structure used to construct the device. It is used in all FTIR-based <u>CURRENT AND FUTURE METROLOGY</u>

		<u>AND GAS PRODUCTS.</u>
5,403,433	4/4/95	Method and Apparatus for Monitoring Layer Processing: <u>ALGORITHMS</u> – This is a fundamental patent covering methods of analysis for surface layer thickness composition and temperature. It is used in Tool ++ for <u>CURRENT AND FUTURE METROLOGY PRODUCTS.</u>
5,432,336	7/11/95	Detector Signal Correction Method and System: <u>FTIR-</u> This is an improvement in the method of patent US 5,136,154. It is employed in all FTIR-based <u>CURRENT AND FUTURE METROLOGY AND GAS PRODUCTS.</u>
5,440,143	8/8/95	Folded-Path Optical Analysis Gas: <u>SENSOR</u> –This patent covers the 20/20 Multi-Pass Gas Cell. The unique design allows a higher optical throughput in a smaller cell than the standard White Cell. It is applied in the <u>INDUCT</u> and <u>MULTI-GAS ANALYZERS.</u>
5,473,429	12/5/95	Method and Apparatus for Controlling the Reciprocating Translation of an Interferometer Reflector or Other Body: <u>FTIR</u> – This patent covers the fast mirror motion turn around circuitry. It is used in all FTIR-based <u>CURRENT AND FUTURE METROLOGY AND GAS PRODUCTS.</u>
5,486,917	1/23/96	Flexure Plate Motion-Transfer Mechanism, Beam-Splitter Assembly, and Interferometer Incorporating the Same: <u>FTIR</u> – This patent covers many of the unique design features of the Company's FTIR. It is used in all FTIR-based <u>CURRENT AND FUTURE METROLOGY AND GAS PRODUCTS.</u>
5,513,828 *	5/7/96	Vibration Immunizing Dynamic Support Structure: <u>FTIR</u> – This patent covers the vibration isolating mirror motion system. It is used in all FTIR-based <u>CURRENT AND FUTURE METROLOGY AND GAS PRODUCTS.</u>
5,588,632 *	12/31/96	Dynamic Support Structure: <u>FTIR</u> – This patent covers an early prototype.
5,604,581	2/18/97	Film Thickness and Free Carrier Concentration Analysis Method and Apparatus: <u>ALGORITHM</u> – This patent covers the method for analyzing multi-layer structures to determine the thickness and composition. It is used in TOOL ++, EPI ON LINE and EPISCAN.
5,675,412	10/7/97	System Including Unified Beamsplitter and Parallel Reflecting Element, And Retroreflecting Component <u>FTIR</u> – This patent covers the very rugged interferometer design used in

		the Company's <u>2100 FTIR</u> . It is used in all FTIR-based <u>CURRENT AND FUTURE METROLOGY AND GAS PRODUCTS</u> .
5,900,633	5/4/99	Spectrometric Method for Analysis of Film Thickness and Composition of a Patterned Sample: <u>ALGORITHM</u> – A method for analyzing films deposited on top of patterns. It will be the basis for <u>INTEGRATED METROLOGY PRODUCTS</u> .
6,161,054	12/12/00	Cell Control Method and Apparatus: <u>ALGORITHM</u> – Patent for <u>TOOL ++</u>
6,192,287	2/20/01	Method and Apparatus For Fault Detection and Control: <u>ALGORITHM</u> – A method for using exhaust gas monitoring for fault detection. This will support <u>TOOL ++</u> APC software with <u>GAS ANALYSIS PRODUCTS</u> .
<u>U.S. Patents Pending</u>	<u>File Date</u>	<u>Title</u>
OLT-6 (secrecy)	2/25/94	Signal Oversampling for Improved S/N in Reflector Movement Systems: <u>FTIR</u> – This patent application covers advanced electronics for the FTIR. It has been allowed but is currently under a secrecy order from the DOD.
OLT-20 ²	12/1/97	Thermal Imaging for Semiconductor Process Monitoring: <u>SENSOR</u> – A method for analyzing radiation from a hot object to simultaneously determine the emissivity, temperature and surface properties. This patent will be the basis for in site <u>FUTURE PRODUCTS</u> .
OLT-22 ³	6/11/98	Method and Apparatus for Determining Processing Chamber Cleaning: <u>SENSOR</u> – This patent covers the use of <u>PROCESS SENSE</u> in the detection of chamber cleaning end point.
OLT-23	6/10/98	Method for Fault Detection and Classification Employing Product Quality Measurements: <u>ALGORITHM</u> – A method which combines wafer state measurements with fault detection to update the fault detection model. This method will be used in <u>TOOL++</u> Advanced Process Control Software
OLT-28 ⁴ (prov. filed)	9/22/99	Method And Apparatus For Performing Optical Measurements Of Layers And Surface Properties On Transparent Substrates: <u>INTEGRATION</u> – Unique optics for eliminating the effect of reflections from the back side of a wafer. This patent will be used in <u>FilmExpert PRODUCTS</u> .
OLT-29 ⁴	12/3/99	Method and Apparatus for Measuring the Composition and Other

(prov. filed)		Properties of Thin Films: <u>ALGORITHM</u> – A method of model based analysis to determine bulk properties of material in films of arbitrary thickness. This patent is the heard of our advanced applications algorithms.
<u>Patents in Preparation</u>		<u>Title</u>
OLT-30-prov		Method And Apparatus For A Multi-Purpose Metrology Module – Apparatus that is capable of use as a stand-alone, automated stand alone, temporary integrated or permanently integrated metrology tool.
<u>Foreign Patents</u>	<u>Issue Date</u>	<u>Title</u>
AFU-9-EP ⁵	7/23/97	Method and System for Detector Signal Correction
<u>Foreign Patents Pending</u>	<u>File Date</u>	<u>Title</u>
AFU-9-CA	5/7/92	Method and System for Photoconductive Detector Signal Correction
AFU-9-JP	5/7/92	Method and System for Photoconductive Detector Signal Correction
AFU-12-CIP-EP ⁶	1/5/93	Structure for the Dynamic Support of Reflective Element, and Interferometer Comprising the Same
AFU-12-CIP AFU-12-JP ⁶	1/5/94	Structure for the Dynamic Support of Reflective Element, and Interferometer Comprising the Same
OLT-13-PCT	11/20/96	Rugged Moving Mirror Interferometer
OLT-13-EP-JP		Rugged Moving Mirror Interferometer

* These patents were assigned to the Company by AFR pursuant to a U.S. Patent Assignment Agreement, dated August 8, 1998. The Company recorded the assigned patents with the U.S. Patent and Trademark office on September 3, 1998. The PTO confirmed the assignment and recording of the 8 subject patents by sending to the Company a Notice of Recordation of Assignment Document, dated January 5, 1999.

¹ Expired by virtue of non-payment of the first required maintenance fee.

² This patent has been abandoned.

³ Counterparts to this provisional application are also pending in the European Patent Office (OLT-22-EP), Israel (OLT-22-IL), Japan (OLT-22-JP), and Singapore (OLT-22-SG).

⁴ These two provisional applications have been perfected as corresponding non-provisional applications OLT-28, filed September 14, 2000, and OLT-29, filed November 11, 2000..

⁵ This foreign patent is valid only in France, Italy, Germany and the United Kingdom.

⁶ These foreign patent applications have been abandoned. The AFU-12-EP European application can be reinstated prior to July 4, 2001 by suitable action, including the payment of a tax and penalty.

Trademark Applications

Metrology 1,2,3

(Serial No. 76-128,400, filed on September 15, 2000. Application Pending.)

List of Unregistered, Common Law Trademarks

Tool++

INDUCT

Wafer On-Line

Process Sense

Epi On-Line

20/20 Long Path Gas Cell

Iron Line

Opti Layer

Ghostbuster Optics

Vista

Isolation Interferometer

MultiGas MPX

MultiGas 2010

MultiGas 2030

FilmExpert

List of Unregistered, Common Law Copyrights

Tool++ Software

Episcan Software

OptiLayer Software

Vista Software

Other Product Names Used or Contemplated

Etch On-Line

Litho On-Line

Poly On-Line

SOI On-Line

Dielectrics On-Line

Film Scan

Smart Spot

Common Sense