

PATENT ASSIGNMENT

Electronic Version v1.1

Stylesheet Version v1.1

SUBMISSION TYPE:	NEW ASSIGNMENT	
NATURE OF CONVEYANCE:	MERGER	
EFFECTIVE DATE:	10/31/2001	
CONVEYING PARTY DATA		
Name		Execution Date
On-Line Technologies, Inc.		10/31/2001
RECEIVING PARTY DATA		
Name:	MKS Instruments, Inc.	
Street Address:	Six Shattuck Road	
City:	Andover	
State/Country:	MASSACHUSETTS	
Postal Code:	01810	
PROPERTY NUMBERS Total: 1		
Property Type	Number	
Application Number:	08202300	
CORRESPONDENCE DATA		
Fax Number:	(617)526-9899	
<i>Correspondence will be sent via US Mail when the fax attempt is unsuccessful.</i>		
Phone:	617.526.9600	
Email:	omannion@proskauer.com	
Correspondent Name:	Proskauer Rose LLP	
Address Line 1:	One International Place	
Address Line 4:	Boston, MASSACHUSETTS 02110	
ATTORNEY DOCKET NUMBER:	ASX-129 (FORMERLY OLT-6)	
NAME OF SUBMITTER:	Isaac A. Hubner	
Total Attachments: 20 source=On-Line#page1.tif source=On-Line#page2.tif source=On-Line#page3.tif		

CH \$40.00 08202300

500471082

PATENT
REEL: 020552 FRAME: 0158

source=On-Line#page4.tif
source=On-Line#page5.tif
source=On-Line#page6.tif
source=On-Line#page7.tif
source=On-Line#page8.tif
source=On-Line#page9.tif
source=On-Line#page10.tif
source=On-Line#page11.tif
source=On-Line#page12.tif
source=On-Line#page13.tif
source=On-Line#page14.tif
source=On-Line#page15.tif
source=On-Line#page16.tif
source=On-Line#page17.tif
source=On-Line#page18.tif
source=On-Line#page19.tif
source=On-Line#page20.tif

HALE AND DORR LLP
C O U N S E L L O R S A T L A W

haledorr.com

60 STATE STREET • BOSTON, MA 02109
617-526-6000 • FAX 617-526-5000

AYLA A. LARI

617-526-6598
ayla.lari@haledorr.com

January 17, 2002

Commissioner of Patents and Trademarks
Box Assignments
Washington, D.C. 20231

Re: Recordal of Articles of Merger of Parent and Subsidiary Corporations
 Conveying Party: On-Line Technologies, Inc.
 Receiving Party: MKS Instruments, Inc.

Dear Sir:

Enclosed for recording in the United States Patent and Trademark Office is the following::

- 1.) Recordation Form Cover Sheet - Patents Only (Form PTO-1595) (*in duplicate*), together with photocopy of Articles of Merger of Parent and Subsidiary Corporations.

In addition, enclosed is a self-addressed, postage prepaid postcard. Please stamp the date of receipt of the subject document(s) on the postcard and return it to the undersigned.

Please charge any fee deficiency or credit any overpayment to Deposit Account No. 08-0219.

Very truly yours,

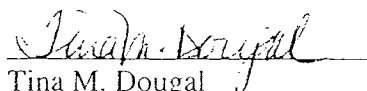


Ayla A. Lari
Registration No. 43,739

/tmd
Enclosure(s)

Certificate of Mailing Under 37 C.F.R. §1.8(a)

I hereby certify that this correspondence and any enclosures referenced therein are being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope address to: Commissioner for Patents and Trademarks, Box Assignments, Washington, D.C. 20231 on January 17, 2002.



Tina M. Dougal

RECORDATION FORM COVER SHEET
PATENTS ONLY

Tab settings 0000 ▼ ▼ ▼ ▼ ▼ ▼ ▼

To the Honorable Commissioner of Patents and Trademarks: Please record the attached original documents or copy thereof.

1. Name of conveying party(ies):

On-Line Technologies, Inc.

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

Name: **MKS Instruments, Inc.**

Internal Address:

Street Address: **Six Shattuck Road**

City: **Andover** State: **MA** Zip: **01810-2495**

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

3. Nature of conveyance:

- ☐ Assignment ☒ Merger
☐ Security Agreement ☐ Change of Name
☐ Other

Execution Date: **October 31, 2001**

Additional name(s) & address(es) attached? ☐ Yes ☒ No

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

If this document is being filed together with a new application, the execution date of the application is :

A. Patent Application No.(s)

B. Patent No.(s)

4,652,755

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 patents involved: **20**

7. Total fee (37 CFR 3.41).....**\$800.00**

- ☐ 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

1/17/2002
Date

Total number of pages including cover sheet, attachments, and document: **19**

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

Form PTO-1595

Conveying Party: On-Line Technologies, Inc.

Receiving Party: MKS Instruments, Inc.

Page 2

4. Patent Numbers (continued)

4,985,858	4,824,790
5,136,154	5,170,223
5,239,488	5,285,167
5,349,438	5,403,433
5,432,336	5,440,143
5,473,429	5,486,917
5,513,828	5,588,632
5,604,581	5,675,412
5,900,633	6,161,054
6,192,287	

Examiner

The Commonwealth of Massachusetts

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, the articles are to be signed by officers having corresponding powers and duties.

P.C.

PATENT
REEL: 020552 FRAME: 0163

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

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

REEL: 020552 FRAME: 0167

Alignment Lasers
Other Test Instruments

CDECD; Webster Bank
CDECD; Webster Bank

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

PATENT

REEL: 020552 FRAME: 0168

		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>

		AND GAS PRODUCTS.
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

PATENT

REEL: 020552 FRAME: 0170

		the Company's 2100 FTIR. 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 on 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

Domain Name Registration

www.online-ftir.com

(b) Alleged intellectual property infringement by the Company on third-party intellectual property:

1. Pursuant to a letter dated August 7, 2000, Moore Epitaxial, Inc. d/b/a Moore Technologies, through its patent counsel, alleged that the Company's EPI On-Line Integrated EPI Monitor ("EPI Monitor") had infringed on U.S. Patent No. 5,872,632, which is assigned to Moore Technologies. The Company's patent counsel responded on August 16, 2000 with its opinion that Moore Technologies' alleged claim of patent infringement was invalid due to the Company's prior publication of a paper that anticipated a similar monitoring tool to the EPI Monitor now manufactured by the Company. No further activity on this claim has occurred.
2. Pursuant to a letter dated June 9, 1995, NIRSystems Incorporated, through its patent counsel, demanded that the Company cease and desist from using the mark "VISION" in connection with the Company's software products for Fourier Transform infrared process monitoring and control systems. A response letter sent by Peter Solomon to NIRSystems patent counsel, dated June 14, 1995, indicated that the Company will comply with the request and immediately cease and desist from further use of the mark VISION in connection with the Company's software products.

Third Party Infringement on Company IP:

See the litigation disclosure in Section 2.19 herein concerning infringement of U.S. Patent 5,440,143 and associated trade secrets related to this technology by Perkin-Elmer Corporation.

(c) The Company owns or has the right to use all Intellectual Property except for the following Licenses and Agreements:

1. Exclusive License Agreement, effective as of July 27, 1992, by and between Graseby Electro-Optics, Inc. and the Company concerning Graseby's right to the linearizer.
2. Exclusive Distributorship Agreement, dated February 16, 1995, by and between Shimadzu Corporation and the Company concerning Shimadzu's right to Particle Technology concerning U.S. Patent No. 4,652,755.
3. Technology Rights Agreement, dated February 4, 1997, amended March 26, 1999, by and between ADE Corporation and the Company concerning ADE rights to the FTIR spectrometer and operating software to permit ADE to manufacture large local FTIR reflectance and/or transmittance measuring system, including patents, know-how etc.
4. AFR license to use internally all technology assigned to the Company and license to use the technology for Raman Spectroscopy pursuant to the final Technology Transfer Agreement to be

defined under new agreement to be executed prior to the Closing. This Agreement will supersede earlier Technology Transfer Agreements between the Company and AFR in each of 1991, 1996, and 1999. In addition, AFR currently owns, jointly with the Company, rights to certain technology developed by consultants performing services for both companies. These rights will be assigned to the Company in the final Technology Transfer Agreement.

5. Joint Venture Agreement among AFR, the Company, ADE, Applied Materials, and MIT, dated as of May 13, 1998.
6. Strategic Partnership Agreement dated October 8, 1999 by and between the Company and PEUS Systems, Inc.
7. Contract for Research by and between Gas Research Institute (GRI) and AFR dated January 6, 1995. AFR subcontracted part of the work under this Agreement to the Company via an oral subcontracting agreement. The Company may be subject to a royalty payment payable to GRI pursuant to the Contract for Research. Any royalty payment due GRI will not have a Company Material Adverse Effect.
8. Rights held by the US Government to use the Company's intellectual property developed pursuant to Government Contracts, where the Company is either the direct contractor or the subcontractor, as disclosed in Section 2.30 herein:
 - (a) NSF Grant No. DMI 0078444 (AFR) (December 4, 2000) SBIR Phase II: "Whole Wafer Thermal Imaging for Real-Time Process Monitoring and Control," \$399,991.
 - (b) NSF Grant No. DMI 9983399 (June 1, 2000), SBIR Phase II "In Situ, Real-Time Process Control for Micro-Electro-Mechanical System (MEMS) Applications," \$399,983
 - (c) U.S. Dept. of Commerce ATP/NIST Co-operative Agreement No. 70NANB7H3058 (September 30, 1997) "Critical Components for Process Control in Microelectronics Manufacturing."
 - (d) Defense Threat Reduction Agency Contract No. DTRA01-99-C-0202 (September 30, 1999) Phase II: "Improved Silicon On Insulator (SOI) Manufacturing Technology for Low Power, High Speed Radiation Hard Devices," \$747,941.
 - (e) Agreement between FLIR Systems, Inc., the Company and AFR dated January 10, 2000.
 - (f) USA SPACE AND MISSILE DEFENSE COMMAND CONTRACT NO. DASG60-98-C-0105 (September 22, 1998) "Small Light Weight Low Power Low Cost FTIR Spectrometer."

- (g) ENVIRONMENTAL PROTECTION AGENCY CONTRACT NO. 68-D-01-037, effective April 1, 2001. SBIR Phase I award for "Exhaust Gas Monitoring for Process Control and Pollution Reduction in Semiconductor Manufacturing."

10. The following Government Contracts have been completed, but the government may retain ownership and/or use rights to the Company's intellectual property pursuant to such contracts and/or the Federal Acquisition Regulations:

- (a) NSF GRANT NO. DMI 9661592 (12/16/99) : SBIR Phase I: "Development of a Cell Controller for Epitaxial Silicon Fabrication," \$74,939.
- (b) NSF GRANT NO. DMI 9631216 (8/28/97): SBIR Phase II: "In-Line process monitoring and control for poly-silicon formation inside cluster tools," \$299,944.
- (c) NSF GRANT NO. DMI 9960353 (11/18/99) : SBIR Phase I: In Situ Chemical analysis of reacting thin films during thermal processing, \$99,983.
- (d) DEFENSE SPECIAL WEAPONS AGENCY CONTRACT NO. DSW01-97-M-0488 (AFR) (8/31/97) "Improved Silicon On Insulator (SOI) Manufacturing Technology for Low-Power, High Speed Radiation Hard Devices."
- (e) US AIR FORCE WRIGHT LAB. CONTRACT NO. F33615-97-C-5134 (4/17/97) "Real Time Whole Wafer Thermo Imaging for Semiconductor process monitoring."
- (f) USA SPACE AND MISSILE DEFENSE COMMAND CONTRACT NO. DASG60-97-M-0129 (4/17/97) Phase I: "Small Light Weight Low Power Low Cost FTIR Spectrometer," \$59,861.
- (g) AIR FORCE RESEARCH LAB CONTRACT NO. F29601-99-C-0081(4/30/99): "Method and instrument for thick-film SOI Non-destructive Characterization."
- (h) US ARMY RESEARCH OFFICE CONTRACT NO DAAG55-98-C-0056 (9/15/98): "Molecular Identification of Biological Agents" (AFR contract).
- (i) NAVAL FACILITIES ENGINEERING COMMAND CONTRACT NO. N47408-99-P-6019 (9/22/99) "A Portable Raman Instrument for Fuel Characterization" (AFR contract).

11. In addition, the Company's various lenders may have rights in and to, or security interests in, the Company's intellectual property. See Section 2.15(a)(iv) herein listing security agreements in connection with the Company's Contracts of Indebtedness:

- (a) Webster Bank
- (b) Tencor

- (c) TechConn
- (d) Connecticut Innovations, Inc.
- (e) DECD

See also Section 2.15(iii) herein concerning certain joint development agreements between the Company and AFR.

(d) Third Party Software Used and Sold by the Company

1. OEM Development Software Site License Agreement, dated May 18, 1998, by and between GW Associates, Inc. (Licensor) and the Company (Licensee) concerning SDR-140 SECS Driver — Owned by GW Associates, Inc. and redistributed by the Company and run-time licensed per machine to end customers under royalty arrangements. Used in SecsTrace and Tool++ Suite.
2. LabVIEW Run-Time Engine — Owned by National Instruments Corp. Redistributed by the Company Technologies to end customers royalty-free per LabVIEW development license (copy attached). Used in all software under license.
3. NI ComponentWorks 3D — Owned by National Instruments Corp., bundled with LabVIEW development system and licensed under same terms as LabVIEW Run-Time Engine. Used in several software suites.
4. NI Report Generator — Owned by National Instruments Corp., bundled with LabVIEW development system and licensed under same terms as LabVIEW Run-Time Engine. Used in several software suites.
5. NI-IMAQ Driver — Owned by National Instruments Corp., bundled with National Instruments' image acquisition hardware and licensed under same terms as LabVIEW Run-Time Engine. Used in FilmExpert Suite and some EpiScan Suites.
6. NI-488.2 Driver — Owned by National Instruments Corp., bundled with National Instruments' GPIB communications hardware and licensed under same terms as LabVIEW Run-Time Engine. Used in most software under license.
7. NI-DAQ Driver — Owned by National Instruments Corp., bundled with National Instruments' data acquisition hardware and licensed under same terms as LabVIEW Run-Time Engine. Used in some software under license.
8. System Bundled — The Company is a reseller of Dell Corp. and other vendors' computer equipment and all "shrinkwrap" licensed software bundled with the systems is transferred to the end customer per reseller agreements with the equipment vendor(s).

9. Customer-Supplied — The Tool++ software requires installation of the Oracle 7 Database, owned by Oracle Corp. The end customer assumes all responsibility for licensing of this software and the Company is not involved in the transaction

(e) Dave Perloff of Metrology Edge did not execute an agreement assigning all rights to copyrightable materials to the Company. The Metrology Edge consulting agreement was never in effect and no services are currently being provided pursuant to that agreement.

Section 2.15: Contracts

(a) (i) Personal Property Leases:

1. Acura Luxury Lease between Advanced Fuel Research Inc. and America Honda Finance Corporation for 2001 dated December 6, 2000 (2001 Acura 3.2TL). The President of the Company is the beneficiary of this Agreement.
2. Equipment Lease between the Company and Copelco Capital, Inc. dated September 26, 2000 (copier; printer).
3. Lease between the Company and Dell Financial Services dated February 28, 2000 (lease no. 006435026-0, computer equipment).
4. Lease between the Company and Dell Financial Services for computer equipment dated February 28, 2000 (no. 006435026-001, computer equipment).
5. Lease Financing Agreement between the Company and Hewlett-Packard for computer equipment dated June 30, 2000

(ii) Commercial Agreements

1. Applied Materials Standard Terms and Conditions of Purchase, executed October 6, 2000, by and between Applied Materials Inc. and the Company. This pertains to the Draft Global Supply Agreement under negotiation between the Company and Applied Materials.
2. Strategic Partnership Agreement, dated October 8, 1999, by and between PEUS-Systems GmbH and the Company.
3. Technology Rights Agreement, dated February 4, 1997, by and between ADE Corporation and the Company, as amended March 26, 1999.
4. Technology Transfer Agreement dated June 30, 1999 between AFR and the Company.
5. Exclusive Distributorship Agreement, dated February 16, 1995, by and between Shimadzu Corporation and the Company. There has been no activity pursuant to this Agreement for approximately five years.

CERTIFICATE OF MERGER

OF

AT LEAST 90% OWNED SUBSIDIARY

1. The name of the surviving corporation in the merger is MKS Instruments, Inc., a corporation organized and existing under the laws of the State of Massachusetts

2. The Plan of Merger Is as follows:

Please see Exhibit A

(All provisions of the Plan of Merger must be included)

3. The Plan of Merger was approved by resolution adopted by the board of directors of
MKS Instruments, Inc.
(Name of Parent Corporation)
4. The approval of the shareholders of the merging corporations was not required.
5. No amendment is made to the charter of the surviving corporation as part of the merger.*

(Include the following for each foreign constituent corporation)

6. MKS Instruments, Inc. has complied with the applicable provisions of the laws of the State of Massachusetts under which it is incorporated, and this merger is permitted by such laws.

Dated: October 31, 2001

MKS Instruments, Inc.

(Surviving Corporation)

By

(Authorized Officer)

Peter R. Younger
President

(The only allowable amendments are those which directors are authorized to make without shareholder approval, as listed in Sec. 33-796.)