State of West Virginia
Department of Administration
Purchasing Division
2019 Washington Street East
Post Office Box 50130
Charleston, WV 25305-0130

Solicitation

NUMBER	PAGE
7713014	1

ADDRESS CORRESPONDENCE TO ATTENTION OF:
ALAN CUMMINGS
304-558-2402

VENDOR
RFQ COPY
TYPE NAME/ADDRESS HERE

Agilent Technologies, Inc.
2850 Centerville Rd., MS 3N3
Wilmington, DE 19808

SHIP TO
DIVISION OF HIGHWAYS
MCS&T DIVISION

190 DRY BRANCH DRIVE
CHARLESTON WV
25306 304-558-9892

DATE PRINTED
01/31/2013

BID OPENING DATE: 02/20/2013 BID OPENING TIME 1:30PM

LINE	QUANTITY	UOP	CAT. NO.	ITEM NUMBER	UNIT PRICE	AMOUNT
0001	1	EA		493-35	58,870.10	58,870.10

ICAP 6300 DUO VIEW ICP-OES SPECTROMETER/OR EQUAL

Agilent Equivalent - 710 Axial Viewed ICP-OES

THE WEST VIRGINIA STATE PURCHASING DIVISION FOR THE AGENCY, THE WEST VIRGINIA DIVISION OF HIGHWAYS, IS SOLICITING BIDS TO PROVIDE THE AGENCY WITH A ICAP 6300 DUO VIEW ICP SPECTROMETER, OR EQUAL PER THE ATTACHED SPECIFICATIONS.

****** THIS IS THE END OF RFQ 7713014 ****** TOTAL: 58,870.10

02/20/13 09:56:07 AM
West Virginia Purchasing Division

*Agilent is bidding in accordance with our response cover letter dated February 15, 2013, quotation 1350917, and referenced materials, which are hereby incorporated by reference. Agilent is offering an equivalent system which meets or exceeds the specifications as described in our response cover letter.

SIGNATURE	TELEPHONE	DATE
*	800-227-9770	2/15/2013
TITLE: Business Sales Specialist	FEIN: 77-0518772	ADDRESS CHANGES TO BE NOTED ABOVE

WHEN RESPONDING TO SOLICITATION, INSERT NAME AND ADDRESS IN SPACE ABOVE LABELED 'VENDOR'

INSTRUCTIONS TO VENDORS SUBMITTING BIDS

1. **REVIEW DOCUMENTS THOROUGHLY:** The attached documents contain a solicitation for bids. Please read these instructions and all documents attached in their entirety. These instructions provide critical information about requirements that if overlooked could lead to disqualification of a Vendor's bid. All bids must be submitted in accordance with the provisions contained in these instructions and the Solicitation. Failure to do so may result in disqualification of Vendor's bid.

2. **MANDATORY TERMS:** The Solicitation may contain mandatory provisions identified by the use of the words "must," "will," and "shall." Failure to comply with a mandatory term in the Solicitation will result in bid disqualification.

3. **PREBID MEETING:** The item identified below shall apply to this Solicitation.

   [✓] A pre-bid meeting will not be held prior to bid opening.

   [ ] A NON-MANDATORY PRE-BID meeting will be held at the following place and time:

   [ ] A MANDATORY PRE-BID meeting will be held at the following place and time:

   All Vendors submitting a bid must attend the mandatory pre-bid meeting. Failure to attend the mandatory pre-bid meeting shall result in disqualification of the Vendor's bid. No one person attending the pre-bid meeting may represent more than one Vendor.

   An attendance sheet provided at the pre-bid meeting shall serve as the official document verifying attendance. The State will not accept any other form of proof or documentation to verify attendance. Any person attending the pre-bid meeting on behalf of a Vendor must list on the attendance sheet his or her name and the name of the Vendor he or she is representing. Additionally, the person attending the pre-bid meeting should include the Vendor's E-Mail address, phone number, and Fax number on the attendance sheet. It is the Vendor's responsibility to locate the attendance sheet and provide the required

information. Failure to complete the attendance sheet as required may result in disqualification of Vendor's bid.

All Vendors should arrive prior to the starting time for the pre-bid. Vendors who arrive after the starting time but prior to the end of the pre-bid will be permitted to sign in, but are charged with knowing all matters discussed at the pre-bid.

Questions submitted at least five business days prior to a scheduled pre-bid will be discussed at the pre-bid meeting if possible. Any discussions or answers to questions at the pre-bid meeting are preliminary in nature and are non-binding. Official and binding answers to questions will be published in a written addendum to the Solicitation prior to bid opening.

4. **VENDOR QUESTION DEADLINE:** Vendors may submit questions relating to this Solicitation to the Purchasing Division. Questions must be submitted in writing. All questions must be submitted on or before the date listed below and to the address listed below in order to be considered. A written response will be published in a Solicitation addendum if a response is possible and appropriate. Non-written discussions, conversations, or questions and answers regarding this Solicitation are preliminary in nature and are non-binding.

Question Submission Deadline: 02/15/2013

Submit Questions to:

Alan Cummings
2019 Washington Street, East
P.O. Box 50130
Charleston, WV 25305
Fax: 304-558-3970
Email: Alan.W.Cummings@WV.Gov

5. **VERBAL COMMUNICATION:** Any verbal communication between the Vendor and any State personnel is not binding, including that made at the mandatory pre-bid conference. Only information issued in writing and added to the Solicitation by an official written addendum by the Purchasing Division is binding.

6. **BID SUBMISSION:** All bids must be signed and delivered by the Vendor to the Purchasing Division at the address listed below on or before the date and time of the bid opening. Any bid received by the Purchasing Division staff is considered to be in the possession of the Purchasing Division and will not be returned for any reason. The bid delivery address is:

Department of Administration, Purchasing Division
2019 Washington Street East
P.O. Box 50130,
Charleston, WV 25305-0130

The bid should contain the information listed below on the face of the envelope or the bid may not be considered:

SEALED BID
BUYER: _____
SOLICITATION NO.: _____
BID OPENING DATE: _____
BID OPENING TIME: _____
FAX NUMBER: _____

In the event that Vendor is responding to a request for proposal, the Vendor shall submit one original technical and one original cost proposal plus [n/a] convenience copies of each to the Purchasing Division at the address shown above. Additionally, the Vendor should identify the bid type as either a technical or cost proposal on the face of each bid envelope submitted in response to a request for proposal as follows:

BID TYPE: [ ] Technical
[ ] Cost

7. **BID OPENING:** Bids submitted in response to this Solicitation will be opened at the location identified below on the date and time listed below. Delivery of a bid after the bid opening date and time will result in bid disqualification. For purposes of this Solicitation, a bid is considered delivered when time stamped by the official Purchasing Division time clock.

Bid Opening Date and Time:	02/20/2013 - 1:30 P.M.
Bid Opening Location:	Department of Administration, Purchasing Division 2019 Washington Street East P.O. Box 50130, Charleston, WV 25305-0130

8. **ADDENDUM ACKNOWLEDGEMENT:** Changes or revisions to this Solicitation will be made by an official written addendum issued by the Purchasing Division. Vendor should acknowledge receipt of all addenda issued with this Solicitation by completing an Addendum Acknowledgment Form, a copy of which is included herewith. Failure to acknowledge addenda may result in bid disqualification. The addendum acknowledgement should be submitted with the bid to expedite document processing.

9. **BID FORMATTING:** Vendor should type or electronically enter the information onto its bid to prevent errors in the evaluation. Failure to type or electronically enter the information may result in bid disqualification.

GENERAL TERMS AND CONDITIONS:

1. **CONTRACTUAL AGREEMENT:** Issuance of a Purchase Order signed by the Purchasing Division Director, or his designee, and approved as to form by the Attorney General's office constitutes acceptance of this Contract made by and between the State of West Virginia and the Vendor. Vendor's signature on its bid signifies Vendor's agreement to be bound by and accept the terms and conditions contained in this Contract.

2. **DEFINITIONS:** As used in this Solicitation / Contract, the following terms shall have the meanings attributed to them below. Additional definitions may be found in the specifications included with this Solicitation / Contract.

   2.1 **"Agency"** or **"Agencies"** means the agency, board, commission, or other entity of the State of West Virginia that is identified on the first page of the Solicitation or any other public entity seeking to procure goods or services under this Contract.

   2.2 **"Contract"** means the binding agreement that is entered into between the State and the Vendor to provide the goods and services requested in the Solicitation.

   2.3 **"Director"** means the Director of the West Virginia Department of Administration, Purchasing Division.

   2.4 **"Purchasing Division"** means the West Virginia Department of Administration, Purchasing Division.

   2.5 **"Purchase Order"** means the document signed by the Agency and the Purchasing Division, and approved as to form by the Attorney General, that identifies the Vendor as the successful bidder and Contract holder.

   2.6 **"Solicitation"** means the official solicitation published by the Purchasing Division and identified by number on the first page thereof.

   2.7 **"State"** means the State of West Virginia and/or any of its agencies, commissions, boards, etc. as context requires.

   2.8 **"Vendor"** or **"Vendors"** means any entity submitting a bid in response to the Solicitation, the entity that has been selected as the lowest responsible bidder, or the entity that has been awarded the Contract as context requires.

3. **CONTRACT TERM; RENEWAL; EXTENSION:** The term of this Contract shall be determined in accordance with the category that has been identified as applicable to this Contract below:

| | | **Term Contract**

Initial Contract Term: This Contract becomes effective on [ ] and extends for a period of [ ] year(s).

Renewal Term: This Contract may be renewed upon the mutual written consent of the Agency, and the Vendor, with approval of the Purchasing Division and the Attorney General's office (Attorney General approval is as to form only). Any request for renewal must be submitted to the Purchasing Division Director thirty (30) days prior to the expiration date of the initial contract term or appropriate renewal term. A Contract renewal shall be in accordance with the terms and conditions of the original contract. Renewal of this Contract is limited to [ ] successive one (1) year periods. Automatic renewal of this Contract is prohibited. Notwithstanding the foregoing, Purchasing Division approval is not required on agency delegated or exempt purchases. Attorney General approval may be required for vendor terms and conditions.

Reasonable Time Extension: At the sole discretion of the Purchasing Division Director, and with approval from the Attorney General's office (Attorney General approval is as to form only), this Contract may be extended for a reasonable time after the initial Contract term or after any renewal term as may be necessary to obtain a new contract or renew this Contract. Any reasonable time extension shall not exceed twelve (12) months. Vendor may avoid a reasonable time extension by providing the Purchasing Division Director with written notice of Vendor's desire to terminate this Contract 30 days prior to the expiration of the then current term. During any reasonable time extension period, the Vendor may terminate this Contract for any reason upon giving the Purchasing Division Director 30 days written notice. Automatic extension of this Contract is prohibited. Notwithstanding the foregoing, Purchasing Division approval is not required on agency delegated or exempt purchases, but Attorney General approval may be required.

| | | **Fixed Period Contract:** This Contract becomes effective upon Vendor's receipt of the notice to proceed and must be completed within [ ] days.

|✓| **One Time Purchase:** The term of this Contract shall run from the issuance of the Purchase Order until all of the goods contracted for have been delivered, but in no event shall this Contract extend for more than one fiscal year.

| | | **Other:** See attached.

4. **NOTICE TO PROCEED:** Vendor shall begin performance of this Contract immediately upon receiving notice to proceed unless otherwise instructed by the Agency. Unless otherwise specified, the fully executed Purchase Order will be considered notice to proceed

5. **QUANTITIES:** The quantities required under this Contract shall be determined in accordance with the category that has been identified as applicable to this Contract below.

   | | **Open End Contract:** Quantities listed in this Solicitation are approximations only, based on estimates supplied by the Agency. It is understood and agreed that the Contract shall cover the quantities actually ordered for delivery during the term of the Contract, whether more or less than the quantities shown.

   | | **Service:** The scope of the service to be provided will be more clearly defined in the specifications included herewith.

   | | **Combined Service and Goods:** The scope of the service and deliverable goods to be provided will be more clearly defined in the specifications included herewith.

   |✓| **One Time Purchase:** This Contract is for the purchase of a set quantity of goods that are identified in the specifications included herewith. Once those items have been delivered, no additional goods may be procured under this Contract without an appropriate change order approved by the Vendor, Agency, Purchasing Division, and Attorney General's office.

6. **PRICING:** The pricing set forth herein is firm for the life of the Contract, unless specified elsewhere within this Solicitation/Contract by the State. A Vendor's inclusion of price adjustment provisions in its bid, without an express authorization from the State in the Solicitation to do so, may result in bid disqualification.

7. **EMERGENCY PURCHASES:** The Purchasing Division Director may authorize the Agency to purchase goods or services in the open market that Vendor would otherwise provide under this Contract if those goods or services are for immediate or expedited delivery in an emergency. Emergencies shall include, but are not limited to, delays in transportation or an unanticipated increase in the volume of work. An emergency purchase in the open market, approved by the Purchasing Division Director, shall not constitute of breach of this Contract and shall not entitle the Vendor to any form of compensation or damages. This provision does not excuse the State from fulfilling its obligations under a One Time Purchase contract.

8. **REQUIRED DOCUMENTS:** All of the items checked below must be provided to the Purchasing Division by the Vendor as specified below.

   | | **BID BOND:** All Vendors shall furnish a bid bond in the amount of five percent (5%) of the total amount of the bid protecting the State of West Virginia. The bid bond must be submitted with the bid.

| | **PERFORMANCE BOND:** The apparent successful Vendor shall provide a performance bond in the amount of [ ]. The performance bond must be issued and received by the Purchasing Division prior to Contract award. On construction contracts, the performance bond must be 100% of the Contract value.

| | **LABOR/MATERIAL PAYMENT BOND:** The apparent successful Vendor shall provide a labor/material payment bond in the amount of 100% of the Contract value. The labor/material payment bond must be issued and delivered to the Purchasing Division prior to Contract award.

In lieu of the Bid Bond, Performance Bond, and Labor/Material Payment Bond, the Vendor may provide certified checks, cashier's checks, or irrevocable letters of credit. Any certified check, cashier's check, or irrevocable letter of credit provided in lieu of a bond must be of the same amount and delivered on the same schedule as the bond it replaces. A letter of credit submitted in lieu of a performance and labor/material payment bond will only be allowed for projects under $100,000. Personal or business checks are not acceptable.

| | **MAINTENANCE BOND:** The apparent successful Vendor shall provide a two (2) year maintenance bond covering the roofing system. The maintenance bond must be issued and delivered to the Purchasing Division prior to Contract award.

| | **WORKERS' COMPENSATION INSURANCE:** The apparent successful Vendor shall have appropriate workers' compensation insurance and shall provide proof thereof upon request.

| | **INSURANCE:** The apparent successful Vendor shall furnish proof of the following insurance prior to Contract award:

[ ] **Commercial General Liability Insurance:** [ ] or more.

[ ] **Builders Risk Insurance:** builders risk – all risk insurance in an amount equal to 100% of the amount of the Contract.

[ ] [ ]

[ ] [ ]

[ ] [ ]

[ ] [ ]

[ ] [ ]

The apparent successful Vendor shall also furnish proof of any additional insurance requirements contained in the specifications prior to Contract award regardless of whether or not that insurance requirement is listed above.

[ ] **LICENSE(S) / CERTIFICATIONS / PERMITS:** In addition to anything required under the Section entitled Licensing, of the General Terms and Conditions, the apparent successful Vendor shall furnish proof of the following licenses, certifications, and/or permits prior to Contract award, in a form acceptable to the Purchasing Division.

[ ]
[ ]
[ ]
[ ]

The apparent successful Vendor shall also furnish proof of any additional licenses or certifications contained in the specifications prior to Contract award regardless of whether or not that requirement is listed above.

9. **LITIGATION BOND:** The Director reserves the right to require any Vendor that files a protest of an award to submit a litigation bond in the amount equal to one percent of the lowest bid submitted or $5,000, whichever is greater. The entire amount of the bond shall be forfeited if the hearing officer determines that the protest was filed for frivolous or improper purpose, including but not limited to, the purpose of harassing, causing unnecessary delay, or needless expense for the Agency. All litigation bonds shall be made payable to the Purchasing Division. In lieu of a bond, the protester may submit a cashier's check or certified check payable to the Purchasing Division. Cashier's or certified checks will be deposited with and held by the State Treasurer's office. If it is determined that the protest has not been filed for frivolous or improper purpose, the bond or deposit shall be returned in its entirety.

10. **ALTERNATES:** Any model, brand, or specification listed herein establishes the acceptable level of quality only and is not intended to reflect a preference for, or in any way favor, a particular brand or vendor. Vendors may bid alternates to a listed model or brand provided that the alternate is at least equal to the model or brand and complies with the required specifications. The equality of any alternate being bid shall be determined by the State at its sole discretion. Any Vendor bidding an alternate model or brand should clearly identify the alternate items in its bid and should include manufacturer's specifications, industry literature, and/or any other relevant documentation demonstrating the equality of the alternate items. Failure to provide information for alternate items may be grounds for rejection of a Vendor's bid.

11. **EXCEPTIONS AND CLARIFICATIONS:** The Solicitation contains the specifications that shall form the basis of a contractual agreement. Vendor shall clearly mark any exceptions, clarifications, or

other proposed modifications in its bid. Exceptions to, clarifications of, or modifications of a requirement or term and condition of the Solicitation may result in bid disqualification.

12. **LIQUIDATED DAMAGES:** Vendor shall pay liquidated damages in the amount n/a for n/a . This clause shall in no way be considered exclusive and shall not limit the State or Agency's right to pursue any other available remedy.

13. **ACCEPTANCE/REJECTION:** The State may accept or reject any bid in whole, or in part. Vendor's signature on its bid signifies acceptance of the terms and conditions contained in the Solicitation and Vendor agrees to be bound by the terms of the Contract, as reflected in the Purchase Order, upon receipt.

14. **REGISTRATION:** Prior to Contract award, the apparent successful Vendor must be properly registered with the West Virginia Purchasing Division and must have paid the $125 fee if applicable.

15. **COMMUNICATION LIMITATIONS:** In accordance with West Virginia Code of State Rules §148-1-6.6, communication with the State of West Virginia or any of its employees regarding this Solicitation during the solicitation, bid, evaluation or award periods, except through the Purchasing Division, is strictly prohibited without prior Purchasing Division approval. Purchasing Division approval for such communication is implied for all agency delegated and exempt purchases.

16. **FUNDING:** This Contract shall continue for the term stated herein, contingent upon funds being appropriated by the Legislature or otherwise being made available. In the event funds are not appropriated or otherwise made available, this Contract becomes void and of no effect beginning on July 1 of the fiscal year for which funding has not been appropriated or otherwise made available.

17. **PAYMENT:** Payment in advance is prohibited under this Contract. Payment may only be made after the delivery and acceptance of goods or services. The Vendor shall submit invoices, in arrears, to the Agency at the address on the face of the purchase order labeled "Invoice To."

18. **UNIT PRICE:** Unit prices shall prevail in cases of a discrepancy in the Vendor's bid.

19. **DELIVERY:** All quotations are considered freight on board destination ("F.O.B. destination") unless alternate shipping terms are clearly identified in the bid. Vendor's listing of shipping terms that contradict the shipping terms expressly required by this Solicitation may result in bid disqualification.

20. **INTEREST:** Interest attributable to late payment will only be permitted if authorized by the West Virginia Code. Presently, there is no provision in the law for interest on late payments.

21. **PREFERENCE:** Vendor Preference may only be granted upon written request and only in accordance with the West Virginia Code § 5A-3-37 and the West Virginia Code of State Rules. A Resident Vendor Certification form has been attached hereto to allow Vendor to apply for the preference. Vendor's

failure to submit the Resident Vendor Certification form with its bid will result in denial of Vendor Preference. Vendor Preference does not apply to construction projects.

22. **SMALL, WOMEN-OWNED, OR MINORITY-OWNED BUSINESSES:** For any solicitations publicly advertised for bid on or after July 1, 2012, in accordance with West Virginia Code §5A-3-37(a)(7) and W. Va. CSR § 148-22-9, any non-resident vendor certified as a small, women-owned, or minority-owned business under W. Va. CSR § 148-22-9 shall be provided the same preference made available to any resident vendor. Any non-resident small, women-owned, or minority-owned business must identify itself as such in writing, must submit that writing to the Purchasing Division with its bid, and must be properly certified under W. Va. CSR § 148-22-9 prior to submission of its bid to receive the preferences made available to resident vendors. Preference for a non-resident small, women-owned, or minority owned business shall be applied in accordance with W. Va. CSR § 148-22-9.

23. **TAXES:** The Vendor shall pay any applicable sales, use, personal property or any other taxes arising out of this Contract and the transactions contemplated thereby. The State of West Virginia is exempt from federal and state taxes and will not pay or reimburse such taxes.

24. **CANCELLATION:** The Purchasing Division Director reserves the right to cancel this Contract immediately upon written notice to the vendor if the materials or workmanship supplied do not conform to the specifications contained in the Contract. The Purchasing Division Director may cancel any purchase or Contract upon 30 days written notice to the Vendor in accordance with West Virginia Code of State Rules § 148-1-7.16.2.

25. **WAIVER OF MINOR IRREGULARITIES:** The Director reserves the right to waive minor irregularities in bids or specifications in accordance with West Virginia Code of State Rules § 148-1-4.6.

26. **TIME:** Time is of the essence with regard to all matters of time and performance in this Contract.

27. **APPLICABLE LAW:** This Contract is governed by and interpreted under West Virginia law without giving effect to its choice of law principles. Any information provided in specification manuals, or any other source, verbal or written, which contradicts or violates the West Virginia Constitution, West Virginia Code or West Virginia Code of State Rules is void and of no effect.

28. **COMPLIANCE:** Vendor shall comply with all applicable federal, state, and local laws, regulations and ordinances. By submitting a bid, Vendors acknowledge that they have reviewed, understand, and will comply with all applicable law.

29. **PREVAILING WAGE:** On any contract for the construction of a public improvement, Vendor and any subcontractors utilized by Vendor shall pay a rate or rates of wages which shall not be less than the fair minimum rate or rates of wages (prevailing wage), as established by the West Virginia Division of Labor under West Virginia Code §§ 21-5A-1 et seq. and available at http://www.sos.wv.gov/administrative-law/wagerates/Pages/default.aspx. Vendor shall be responsible for ensuring compliance with prevailing wage requirements and determining when prevailing wage

requirements are applicable. The required contract provisions contained in West Virginia Code of State Rules § 42-7-3 are specifically incorporated herein by reference.

30. **ARBITRATION:** Any references made to arbitration contained in this Contract, Vendor's bid, or in any American Institute of Architects documents pertaining to this Contract are hereby deleted, void, and of no effect.

31. **MODIFICATIONS:** This writing is the parties' final expression of intent. Notwithstanding anything contained in this Contract to the contrary, no modification of this Contract shall be binding without mutual written consent of the Agency, and the Vendor, with approval of the Purchasing Division and the Attorney General's office (Attorney General approval is as to form only). **No Change shall be implemented by the Vendor until such time as the Vendor receives an approved written change order from the Purchasing Division.**

32. **WAIVER:** The failure of either party to insist upon a strict performance of any of the terms or provision of this Contract, or to exercise any option, right, or remedy herein contained, shall not be construed as a waiver or a relinquishment for the future of such term, provision, option, right, or remedy, but the same shall continue in full force and effect. Any waiver must be expressly stated in writing and signed by the waiving party.

33. **SUBSEQUENT FORMS:** The terms and conditions contained in this Contract shall supersede any and all subsequent terms and conditions which may appear on any form documents submitted by Vendor to the Agency or Purchasing Division such as price lists, order forms, invoices, sales agreements, or maintenance agreements, and includes internet websites or other electronic documents. Acceptance or use of Vendor's forms does not constitute acceptance of the terms and conditions contained thereon.

34. **ASSIGNMENT:** Neither this Contract nor any monies due, or to become due hereunder, may be assigned by the Vendor without the express written consent of the Agency, the Purchasing Division, the Attorney General's office (as to form only), and any other government agency or office that may be required to approve such assignments. Notwithstanding the foregoing, Purchasing Division approval may or may not be required on certain agency delegated or exempt purchases.

35. **WARRANTY:** The Vendor expressly warrants that the goods and/or services covered by this Contract will: (a) conform to the specifications, drawings, samples, or other description furnished or specified by the Agency; (b) be merchantable and fit for the purpose intended; and (c) be free from defect in material and workmanship.

36. **STATE EMPLOYEES:** State employees are not permitted to utilize this Contract for personal use and the Vendor is prohibited from permitting or facilitating the same.

37. **BANKRUPTCY:** In the event the Vendor files for bankruptcy protection, the State of West Virginia may deem this Contract null and void, and terminate this Contract without notice.

38. **HIPAA BUSINESS ASSOCIATE ADDENDUM**: The West Virginia State Government HIPAA Business Associate Addendum (BAA), approved by the Attorney General, is available online at **http://www.state.wv.us/admin/purchase/vrc/hipaa.html** and is hereby made part of the agreement provided that the Agency meets the definition of a Covered entity (45 CFR §160.103) and will be disclosing Protected Health Information (45 CFR §160.103) to the Vendor.

39. **CONFIDENTIALITY**: The Vendor agrees that it will not disclose to anyone, directly or indirectly, any such personally identifiable information or other confidential information gained from the Agency, unless the individual who is the subject of the information consents to the disclosure in writing or the disclosure is made pursuant to the Agency's policies, procedures, and rules. Vendor further agrees to comply with the Confidentiality Policies and Information Security Accountability Requirements, set forth in http://www.state.wv.us/admin/purchase/privacy/default.html.

40. **DISCLOSURE:** Vendor's response to the Solicitation and the resulting Contract are considered public documents and will be disclosed to the public in accordance with the laws, rules, and policies governing the West Virginia Purchasing Division. Those laws include, but are not limited to, the Freedom of Information Act found in West Virginia Code § 29B-1-1 et seq.

    If a Vendor considers any part of its bid to be exempt from public disclosure, Vendor must so indicate by specifically identifying the exempt information, identifying the exemption that applies, providing a detailed justification for the exemption, segregating the exempt information from the general bid information, and submitting the exempt information as part of its bid but in a segregated and clearly identifiable format. Failure to comply with the foregoing requirements will result in public disclosure of the Vendor's bid without further notice. A Vendor's act of marking all or nearly all of its bid as exempt is not sufficient to avoid disclosure and WILL NOT BE HONORED. Vendor's act of marking a bid or any part thereof as "confidential" or "proprietary" is not sufficient to avoid disclosure and WILL NOT BE HONORED. In addition, a legend or other statement indicating that all or substantially all of the bid is exempt from disclosure is not sufficient to avoid disclosure and WILL NOT BE HONORED. Vendor will be required to defend any claimed exemption for nondisclosure in the event of an administrative or judicial challenge to the State's nondisclosure. Vendor must indemnify the State for any costs incurred related to any exemptions claimed by Vendor. Any questions regarding the applicability of the various public records laws should be addressed to your own legal counsel prior to bid submission.

41. **LICENSING:** In accordance with West Virginia Code of State Rules §148-1-6.1.7, Vendor must be licensed and in good standing in accordance with any and all state and local laws and requirements by any state or local agency of West Virginia, including, but not limited to, the West Virginia Secretary of State's Office, the West Virginia Tax Department, West Virginia Insurance Commission, or any other state agency or political subdivision. Upon request, the Vendor must provide all necessary releases to obtain information to enable the Purchasing Division Director or the Agency to verify that the Vendor is licensed and in good standing with the above entities.

42. **ANTITRUST:** In submitting a bid to, signing a contract with, or accepting a Purchase Order from any agency of the State of West Virginia, the Vendor agrees to convey, sell, assign, or transfer to the State of West Virginia all rights, title, and interest in and to all causes of action it may now or hereafter acquire under the antitrust laws of the United States and the State of West Virginia for price fixing and/or unreasonable restraints of trade relating to the particular commodities or services purchased or acquired by the State of West Virginia. Such assignment shall be made and become effective at the time the purchasing agency tenders the initial payment to Vendor.

43. **VENDOR CERTIFICATIONS:** By signing its bid or entering into this Contract, Vendor certifies (1) that its bid was made without prior understanding, agreement, or connection with any corporation, firm, limited liability company, partnership, person or entity submitting a bid for the same material, supplies, equipment or services; (2) that its bid is in all respects fair and without collusion or fraud; (3) that this Contract is accepted or entered into without any prior understanding, agreement, or connection to any other entity that could be considered a violation of law; and (4) that it has reviewed this RFQ in its entirety; understands the requirements, terms and conditions, and other information contained herein. Vendor's signature on its bid also affirms that neither it nor its representatives have any interest, nor shall acquire any interest, direct or indirect, which would compromise the performance of its services hereunder. Any such interests shall be promptly presented in detail to the Agency.

    The individual signing this bid on behalf of Vendor certifies that he or she is authorized by the Vendor to execute this bid or any documents related thereto on Vendor's behalf; that he or she is authorized to bind the Vendor in a contractual relationship; and that, to the best of his or her knowledge, the Vendor has properly registered with any State agency that may require registration.

44. **PURCHASING CARD ACCEPTANCE:** The State of West Virginia currently utilizes a Purchasing Card program, administered under contract by a banking institution, to process payment for goods and services. The Vendor must accept the State of West Virginia's Purchasing Card for payment of all orders under this Contract unless the box below is checked.

    | ✓ | Vendor is not required to accept the State of West Virginia's Purchasing Card as payment for all goods and services.

45. **VENDOR RELATIONSHIP:** The relationship of the Vendor to the State shall be that of an independent contractor and no principal-agent relationship or employer-employee relationship is contemplated or created by this Contract. The Vendor as an independent contractor is solely liable for the acts and omissions of its employees and agents. Vendor shall be responsible for selecting, supervising, and compensating any and all individuals employed pursuant to the terms of this Solicitation and resulting contract. Neither the Vendor, nor any employees or subcontractors of the Vendor, shall be deemed to be employees of the State for any purpose whatsoever. Vendor shall be exclusively responsible for payment of employees and contractors for all wages and salaries, taxes, withholding payments, penalties, fees, fringe benefits, professional liability insurance premiums, contributions to insurance and pension, or other deferred compensation plans, including but not limited to, Workers' Compensation and Social Security obligations, licensing fees, *etc.* and the filing of all necessary documents, forms and returns pertinent to all of the foregoing. Vendor shall hold harmless the

State, and shall provide the State and Agency with a defense against any and all claims including, but not limited to, the foregoing payments, withholdings, contributions, taxes, Social Security taxes, and employer income tax returns.

46. **INDEMNIFICATION:** The Vendor agrees to indemnify, defend, and hold harmless the State and the Agency, their officers, and employees from and against: (1) Any claims or losses for services rendered by any subcontractor, person, or firm performing or supplying services, materials, or supplies in connection with the performance of the Contract; (2) Any claims or losses resulting to any person or entity injured or damaged by the Vendor, its officers, employees, or subcontractors by the publication, translation, reproduction, delivery, performance, use, or disposition of any data used under the Contract in a manner not authorized by the Contract, or by Federal or State statutes or regulations; and (3) Any failure of the Vendor, its officers, employees, or subcontractors to observe State and Federal laws including, but not limited to, labor and wage and hour laws.

47. **PURCHASING AFFIDAVIT:** In accordance with West Virginia Code § 5A-3-10a, all Vendors are required to sign, notarize, and submit the Purchasing Affidavit stating that neither the Vendor nor a related party owe a debt to the State in excess of $1,000. The affidavit must be submitted prior to award, but should be submitted with the Vendor's bid. A copy of the Purchasing Affidavit is included herewith.

48. **ADDITIONAL AGENCY AND LOCAL GOVERNMENT USE:** This Contract may be utilized by and extends to other agencies, spending units, and political subdivisions of the State of West Virginia; county, municipal, and other local government bodies; and school districts ("Other Government Entities"). This Contract shall be extended to the aforementioned Other Government Entities on the same prices, terms, and conditions as those offered and agreed to in this Contract. If the Vendor does not wish to extend the prices, terms, and conditions of its bid and subsequent contract to the Other Government Entities, the Vendor must clearly indicate such refusal in its bid. A refusal to extend this Contract to the Other Government Entities shall not impact or influence the award of this Contract in any manner.

49. **CONFLICT OF INTEREST:** Vendor, its officers or members or employees, shall not presently have or acquire any interest, direct or indirect, which would conflict with or compromise the performance of its obligations hereunder. Vendor shall periodically inquire of its officers, members and employees to ensure that a conflict of interest does not arise. Any conflict of interest discovered shall be promptly presented in detail to the Agency.

50. **REPORTS:** Vendor shall provide the Agency and/or the Purchasing Division with the following reports identified by a checked box below:

[ ] Such reports as the Agency and/or the Purchasing Division may request. Requested reports may include, but are not limited to, quantities purchased, agencies utilizing the contract, total contract expenditures by agency, etc.

| | Quarterly reports detailing the total quantity of purchases in units and dollars, along with a listing of purchases by agency. Quarterly reports should be delivered to the Purchasing Division via email at purchasing.requisitions@wv.gov.

51. **BACKGROUND CHECK:** In accordance with W. Va. Code § 15-2D-3, the Director of the Division of Protective Services shall require any service provider whose employees are regularly employed on the grounds or in the buildings of the Capitol complex or who have access to sensitive or critical information to submit to a fingerprint-based state and federal background inquiry through the state repository. The service provider is responsible for any costs associated with the fingerprint-based state and federal background inquiry.

    After the contract for such services has been approved, but before any such employees are permitted to be on the grounds or in the buildings of the Capitol complex or have access to sensitive or critical information, the service provider shall submit a list of all persons who will be physically present and working at the Capitol complex to the Director of the Division of Protective Services for purposes of verifying compliance with this provision.

    The State reserves the right to prohibit a service provider's employees from accessing sensitive or critical information or to be present at the Capitol complex based upon results addressed from a criminal background check.

    Service providers should contact the West Virginia Division of Protective Services by phone at (304) 558-9911 for more information.

52. **PREFERENCE FOR USE OF DOMESTIC STEEL PRODUCTS:** Except when authorized by the Director of the Purchasing Division pursuant to W. Va. Code § 5A-3-56, no contractor may use or supply steel products for a State Contract Project other than those steel products made in the United States. A contractor who uses steel products in violation of this section may be subject to civil penalties pursuant to W. Va. Code § 5A-3-56. As used in this section:

    a. "State Contract Project" means any erection or construction of, or any addition to, alteration of or other improvement to any building or structure, including, but not limited to, roads or highways, or the installation of any heating or cooling or ventilating plants or other equipment, or the supply of and materials for such projects, pursuant to a contract with the State of West Virginia for which bids were solicited on or after June 6, 2001.

    b. "Steel Products" means products rolled, formed, shaped, drawn, extruded, forged, cast, fabricated or otherwise similarly processed, or processed by a combination of two or more or such operations, from steel made by the open heath, basic oxygen, electric furnace, Bessemer or other steel making process.

    The Purchasing Division Director may, in writing, authorize the use of foreign steel products if:

    a. The cost for each contract item used does not exceed one tenth of one percent (.1%) of the total

contract cost or two thousand five hundred dollars ($2,500.00), whichever is greater. For the purposes of this section, the cost is the value of the steel product as delivered to the project; or

b. The Director of the Purchasing Division determines that specified steel materials are not produced in the United States in sufficient quantity or otherwise are not reasonably available to meet contract requirements.

53. PREFERENCE FOR USE OF DOMESTIC ALUMINUM, GLASS, AND STEEL: In Accordance with W. Va. Code § 5-19-1 et seq., and W. Va. CSR § 148-10-1 et seq., for every contract or subcontract, subject to the limitations contained herein, for the construction, reconstruction, alteration, repair, improvement or maintenance of public works or for the purchase of any item of machinery or equipment to be used at sites of public works, only domestic aluminum, glass or steel products shall be supplied unless the spending officer determines, in writing, after the receipt of offers or bids, (1) that the cost of domestic aluminum, glass or steel products is unreasonable or inconsistent with the public interest of the State of West Virginia, (2) that domestic aluminum, glass or steel products are not produced in sufficient quantities to meet the contract requirements, or (3) the available domestic aluminum, glass, or steel do not meet the contract specifications. This provision only applies to public works contracts awarded in an amount more than fifty thousand dollars ($50,000) or public works contracts that require more than ten thousand pounds of steel products.

The cost of domestic aluminum, glass, or steel products may be unreasonable if the cost is more than twenty percent (20%) of the bid or offered price for foreign made aluminum, glass, or steel products. If the domestic aluminum, glass or steel products to be supplied or produced in a "substantial labor surplus area", as defined by the United States Department of Labor, the cost of domestic aluminum, glass, or steel products may be unreasonable if the cost is more than thirty percent (30%) of the bid or offered price for foreign made aluminum, glass, or steel products.

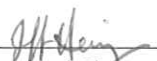
This preference shall be applied to an item of machinery or equipment, as indicated above, when the item is a single unit of equipment or machinery manufactured primarily of aluminum, glass or steel, is part of a public works contract and has the sole purpose or of being a permanent part of a single public works project. This provision does not apply to equipment or machinery purchased by a spending unit for use by that spending unit and not as part of a single public works project.

All bids and offers including domestic aluminum, glass or steel products that exceed bid or offer prices including foreign aluminum, glass or steel products after application of the preferences provided in this provision may be reduced to a price equal to or lower than the lowest bid or offer price for foreign aluminum, glass or steel products plus the applicable preference. If the reduced bid or offer prices are made in writing and supersede the prior bid or offer prices, all bids or offers, including the reduced bid or offer prices, will be reevaluated in accordance with this rule.

CERTIFICATION AND SIGNATURE PAGE

By signing below, I certify that I have reviewed this Solicitation in its entirety; understand the requirements, terms and conditions, and other information contained herein; that I am submitting this bid or proposal for review and consideration; that I am authorized by the bidder to execute this bid or any documents related thereto on bidder's behalf; that I am authorized to bind the bidder in a contractual relationship; and that to the best of my knowledge, the bidder has properly registered with any State agency that may require registration.

Agilent Technologies, Inc.
(Company)

* 
(Authorized Signature)

Jeff Harrigan, Business Sales Specailist
(Representative Name, Title)

800-227-9770 302-633-8953
(Phone Number) (Fax Number)

02/15/2013
(Date)

*To the best of my knowledge.

ADDENDUM ACKNOWLEDGEMENT FORM
SOLICITATION NO.: 7713014

Instructions: Please acknowledge receipt of all addenda issued with this solicitation by completing this addendum acknowledgment form. Check the box next to each addendum received and sign below. Failure to acknowledge addenda may result in bid disqualification.

Acknowledgment: I hereby acknowledge receipt of the following addenda and have made the necessary revisions to my proposal, plans and/or specification, etc.

Addendum Numbers Received:
(Check the box next to each addendum received)

[ ] Addendum No. 1	[ ] Addendum No. 6
[ ] Addendum No. 2	[ ] Addendum No. 7
[ ] Addendum No. 3	[ ] Addendum No. 8
[ ] Addendum No. 4	[ ] Addendum No. 9
[ ] Addendum No. 5	[ ] Addendum No. 10

I understand that failure to confirm the receipt of addenda may be cause for rejection of this bid. I further understand that any verbal representation made or assumed to be made during any oral discussion held between Vendor's representatives and any state personnel is not binding. Only the information issued in writing and added to the specifications by an official addendum is binding.

Agilent Technologies, Inc.
Company

* 
Authorized Signature

2/15/2013
Date

NOTE: This addendum acknowledgement should be submitted with the bid to expedite document processing.

SPECIFICATIONS

1. **PURPOSE AND SCOPE:** The West Virginia Purchasing Division is soliciting bids on behalf of WV Division of Highways, MCS&T Division to establish a contract for the one time purchase of an iCAP 6300 Duo View ICP Spectrometer, or equivalent.

2. **DEFINITIONS:** The terms listed below shall have the meanings assigned to them below. Additional definitions can be found in section 2 of the General Terms and Conditions.

   2.1 **"Contract Item"** means a compact bench mounted spectrometer, providing simultaneously inductively coupled plasma (ICP) spectrometer, capable of analysis and quantification of trace elements in both liquid and solid samples.

   2.2 **"Pricing Page"** means the pages upon which Vendor should list its proposed price for the Contract Items in the manner requested. The Pricing Page is either included on the last page of this RFQ or attached hereto as Exhibit A.

   2.3 **"RFQ"** means the official request for quotation published by the Purchasing Division and identified as 7713014.

3. GENERAL REQUIREMENTS:

   3.1 **Mandatory Contract Item Requirements:** Contract Item must meet or exceed the mandatory requirements listed below.

      3.1.1 iCap 6300 Duo View ICP-OES Spectrometer, or equivalent

         3.1.1.1 The Spectrometer must be capable of conducting chemical analysis on samples of plain carbon and low alloy steel, as noted in ASTM E350 Standard, as well as analyzing samples of cements, as noted in ASTM C114, fly ash, as noted in ASTM C311, and road salt, as noted in ASTM D632.

         3.1.1.2 The Spectrometer must be capable of simultaneously analyzing required elements with detection limits of less than 1 ppb, and must include duo plasma viewing system providing both axial and radial torch views from a single configuration.

3.1.1.3 The Spectrometer must be a compact bench mounted unit with dimensions no greater than 840mm (w) x 750mm (d) x 590mm (h), and the system must be supplied complete with the software that allows analyst to add wavelengths, create methods, analyze samples and post-process the data while the spectrometer is acquiring data, and be compatible with Windows XP and Windows 7 operating systems.

3.1.1.4 The Spectrometer must be suitable for 200 – 240v: 50/26Hz operation from a single phase 32A/20A supply.

3.1.1.5 The Spectrometer must employ a water cooled RF generator with safety interlocks throughout the system providing safe shut down of the generator without damage to the instrument in the event of power failure. In addition, all failure events must be recorded to an electronic journal.

3.1.1.6 The Spectrometer must employ a triple stage cooled Charge Injection Device (CID) detector, cooled to -45°C with solid state electronics to ensure high contrast/low noise imaging and quantification of all wavelengths in the analytical range without blooming. The CID must be photoactive over the whole surface area to enable continuous wavelength coverage and must contain a minimum of 540 x 540 pixels.

4 CONTRACT AWARD:

4.1 Contract Award: The Contract is intended to provide Agencies with a purchase price for the Contract Items. The Contract shall be awarded to the Vendor that provides the Contract Items meeting the required specifications for the lowest overall total cost as shown on the Pricing Pages.

4.2 Pricing Page: Vendor should complete the Pricing Page in full as failure to complete the Pricing Page in its entirety may result in Vendor's bid being disqualified.

Notwithstanding the foregoing, the Purchasing Division may correct errors as it deems appropriate. Vendor should type or electronically enter the information into the Pricing Page to prevent errors in the evaluation.

5 PAYMENT:

5.1 Payment: Vendor shall accept payment in accordance with the payment procedures of the State of West Virginia.

6 DELIVERY AND RETURN:

6.1 Shipment and Delivery: Vendor shall ship the Contract Items immediately after being awarded this Contract and receiving a purchase order or notice to proceed. Vendor shall deliver the Contract Items within 6-8 weeks ARO after receiving a purchase order or notice to proceed. Contract Items must be delivered to Agency at 190 Dry Branch Drive, Charleston, WV 25306.

6.2 Late Delivery: The Agency placing the order under this Contract must be notified in writing if the shipment of the Contract Items will be delayed for any reason. Any delay in delivery that could cause harm to an Agency will be grounds for cancellation of the Contract, and/or obtaining the Contract Items from a third party.

Any Agency seeking to obtain the Contract Items from a third party under this provision must first obtain approval of the Purchasing Division.

6.3 Delivery Payment/Risk of Loss: Vendor shall deliver the Contract Items F.O.B. destination to the Agency's location.

6.4 Return of Unacceptable Items: If the Agency deems the Contract Items to be unacceptable, the Contract Items shall be returned to Vendor at Vendor's expense and with no restocking charge. Vendor shall either make arrangements for the return within five (5) days of being notified that items are unacceptable, or permit the Agency to arrange for the return and reimburse Agency for delivery expenses. If the original packaging cannot be utilized for the return, Vendor will supply the Agency with appropriate return packaging upon request. All returns of unacceptable items shall be F.O.B. the Agency's location. The returned product shall either be replaced, or the Agency shall receive a full credit or refund for the purchase price, at the Agency's discretion.

6.5 Return Due to Agency Error: Items ordered in error by the Agency will be returned for credit within 30 days of receipt, F.O.B. Vendor's location. Vendor shall not charge a restocking fee if returned products are in a

resalable condition. Items shall be deemed to be in a resalable condition if they are unused and in the original packaging. Any restocking fee for items not in a resalable condition shall be the lower of the Vendor's customary restocking fee or 5% of the total invoiced value of the returned items.

EXHIBIT A

PRICING PAGE
RFQ#: 77-13-014

Item Number	Quantity	Unit of Measure	Description	"Or Equal" Make/Model	Total
1	1	each	DUO VIEW ICP-OES	Agilent 710 (Qt 1350917)	$58,870.10

Agilent Technologies, Inc.
Customer Sales and Service
2850 Centerville Road, MS 3N3
Wilmington, DE 19808

800 227 9770 telephone
302 993 5941 facsimile
www.agilent.com

Agilent Technologies

February 15, 2013

Alan Cummings
State of WV
Dept of Adm
Purchasing Div
2019 Washington Street East
P.O. Box 50130
Charleston, WV 25305

Ref: Solicitation No. 7713014 for ICAP 6300 Duo View ICP-OES Spectrometer/or Equal

This is Agilent Technologies response to State of WV Department of Administration for ICAP 6300 View ICP-OES Spectrometer/or Equal Solicitation 7713014 due 2/15/13.

Included in this response are the following items:

1-Copy of this Agilent Cover Letter.

2-Agilent Quotation No. **1350917** for all required items plus, installation, familiarization, 2 days on-site Training, and all delivery costs.

3-Completed Copies of all Required Bid Documents.

4-Copy of required completed **Price Page** for RFQ # 7713014 listing total pricing of all items quoted by Agilent Technologies.

5-Copies of following Agilent Technical Information that gives details on why quoted 720 ES Agilent ICP/OES is unique, as compared to competition:

-Agilent 710 ES **Brochure**
-Agilent 710 **Specifications that included detection limits for all elements of interest**
-Agilent 700 Series **Pre-Installation Manual(e.g. all required utilities information, etc)**
-710 ES Key Advantages Listing
-Agilent **One View Advantage Application Note**
-Agilent **710/715 ES Solid State CCD Detector Application Note**
-Agilent **40 MHz RF Application Note**
-Agilent 700 ES **Background Options Application Note**
-Agilent 700 ES **FACT Spectral Deconvolution Application Note**

Agilent Technologies

Please allow me to make following comments about this response:

With this Agilent 710 ES ICP/OES submission we have **offered an equivalent or better solution to all the specifications listed in this RFQ**. We have exceeded your request with the inclusion of 2 days on-site training in ADDITION to the required familiarization specified. This is another cost saving over $6150 to State of WV.

This offer includes our Simultaneous 710 Axial ES One-View Spectrometer with sample introduction kit, heat exchanger, PC/Monitor/Printer, Software running on Windows 7, 64 byte platform, 2 days on-site training, familiarization/installation, and all delivery costs included. Delivery of ICP/OES Package will be about 37 days from time PO is received/accepted by Agilent Technologies

Please review **Agilent One View Information** that shows how that Dual View, which we do not supply, is no longer an advantageous option , since we can supply LDRs equal to or greater than any Dual View instrument in half the time that a dual view instrument can generate equivalent data. Agilent has been market leader of Simultaneous ICP/OES instrumentation since 2006. We introduced our simultaneous ICP/OES product in 1998 and it took us from 1998-2006 to achieve market leadership. Dual view was the most significant objection of our prospects, but since 1998, I have asked all ICP/OES prospects to show us anything that a dual view can do better than our One View ICP/OES and I have yet to find anything thus far! Our instrument can do it as well or better with many other advantages due to unique Continuous CCD Detector created solely for this unique instrument.

We have Agilent Instrument Demo Laboratories in Wood Dale, IL(near Chicago) and Wilmington, DE, where we can accommodate complete demonstrations of the unique features of our quoted 710 ES ICP/OES. We are also capable of setting up remote Software WebEx demonstrations of software operations of our ICP/OES instrumentation upon request.

The Agilent 720 Simultaneous ES ICP/OES quoted **exceeds specifications** in that Agilent is ONLY vendor that has unique ability to determine ALL wavelengths between specified 177-785 nm, while all other competitors cannot. This unique ability of the Agilent ICP will allows end user the advantage of not using Inter Element Corrections to eliminate spectral interferences, unless IECs are required, which our software is fully capable of generating.

Please note that Agilent Specifications which list our published detection limits are Instrument Detection Limits(IDLs) based on analysis of blank solutions using 30 second integration times. One can multiple these IDLs in our Specification by a factor of 10 and approximate Method Detection Limit(MDL). These detection limits can be reduced by almost another 50 % by increasing integration times to 60 seconds.

Agilent Technologies

Our software runs on Windows 7, 64 byte platform. All data generated is ASCI delimited files that can be transported to any relationship date base system. We allow for automatic CVS files to be generated for such data transmission and can generate reports based on allowed parameters with in our own software package.

We hope that State of WV will begin a long relationship with Agilent Technologies and will accept our unique 710 ES ICP/OES offer. If there are any questions to this response please contact Vic Gill, Agilent Product Specialist at 513 520 5861 or vic.gill@agilent.com.

Sincerely,

Vic Gill
Agilent Product Specialist

Agilent Technologies

Quotation

Alan Cummings
State of West Virginia
190 Dry Branch Drive
Charleston WV 25306

Quote No.	Create Date	Delivery Time	Page
1350917	02/07/2013	5 Weeks	1 of 4

Contact	Phone no.	Valid to
Vic Gill	513-520-5861	04/21/2013

To place an order: Call 1-800-227-9770 Option 1
For Instruments Fax : 302-633-8953
For Consumables Fax : 302-633-8901
Email : LSCAinstrumentsales@agilent.com
For Genomics Fax: 512-321-3128
Email : orders@agilent.com
For additional instructions, see last page

Product/Description	Qty/Unit	Unit List Price	Discount Amount	Extended Net Price
G8465AA Agilent 710 axial viewed ICP-OES with pressure regulated nebulizer gas, 3 channel pump, echelle optics, Megapixel CCD, OneNeb nebulizer, glass cyclonic spraychamber, PC and ICP Expert Software	1.000 EA	**80,056.00 USD**	**28,019.60-**	**52,036.40**
With the following configuration: Ship-to Country : USA Installation (44K) Familiarization at Installation (44L)				
		Item Total		**52,036.40**

Special discount of 35.00 % is applied.

Agilent Technologies

Quotation

Alan Cummings
State of West Virginia
190 Dry Branch Drive
Charleston WV 25306

Quote No.	Create Date	Delivery Time	Page
1350917	02/07/2013	5 Weeks	2 of 4

Contact	Phone no.	Valid to
Vic Gill	513-520-5861	04/21/2013

To place an order: Call 1-800-227-9770 Option 1
For Instruments Fax : 302-633-8953
For Consumables Fax : 302-633-8901
Email : LSCAinstrumentsales@agilent.com
For Genomics Fax: 512-321-3128
Email : orders@agilent.com

Product/Description	Qty/Unit	Unit List Price	Discount Amount	Extended Net Price
6610030100 Bottle ICP-OES Wavecal soln 500mL 5 ppm ICP-OES wavelength calibration solution; 500 mL, contains 5 mg/L Al, As, Ba, Cd, Co, Cr, Cu, Mn, Mo, Ni, Pb, Se, Sr, Zn and 50 mg/L K in 5 % HNO3 + tr HF	1.000 EA	**390.00 USD**	**136.50-**	**253.50**
		Item Total		**253.50**

Special discount of 35.00 % is applied.

G1879B Heat exchanger PolyScience Model 3370 Air Cooled Recirculator With the following configuration: Ship-to Country : USA	1.000 EA	**1,608.00 USD**	**562.80-**	**1,045.20**
		Item Total		**1,045.20**

Special discount of 35.00 % is applied.

Agilent Technologies

Quotation

Quote No.	Create Date	Delivery Time	Page
1350917	02/07/2013	5 Weeks	3 of 4

Contact	Phone no.	Valid to
Vic Gill	513-520-5861	04/21/2013

To place an order: Call 1-800-227-9770 Option 1
For Instruments Fax : 302-633-8953
For Consumables Fax : 302-633-8901
Email : LSCAinstrumentsales@agilent.com
For Genomics Fax: 512-321-3128
Email : orders@agilent.com

Alan Cummings
State of West Virginia
190 Dry Branch Drive
Charleston WV 25306

Product/Description	Qty/Unit	Unit List Price	Discount Amount	Extended Net Price
H2149A Chemical Analysis Application Consulting Provides on-site assistance. For consulting, training, documentation and implementation services. Requires option.	1.000 EA			
With the following configuration: Ship-to Country : USA Two Day On-site (Includes Travel)	1 EA	6,150.00 USD	615.00-	5,535.00
		Item Total		**5,535.00**

Special discount of 10.00 % is applied.

Gross Amount	: $	88,204.00
Total Discount	: $	29,333.90
Net Amount	: $	58,870.10
Total	**: $**	**58,870.10**

Agilent Technologies

Quotation

Quote No.	Create Date	Delivery Time	Page
1350917	02/07/2013	5 Weeks	4 of 4

Contact	Phone no.	Valid to
Vic Gill	513-520-5861	04/21/2013

To place an order: Call 1-800-227-9770 Option 1
For Instruments Fax : 302-633-8953
For Consumables Fax : 302-633-8901
Email : LSCAinstrumentsales@agilent.com
For Genomics Fax: 512-321-3128
Email : orders@agilent.com

Alan Cummings
State of West Virginia
190 Dry Branch Drive
Charleston WV 25306

TO PLACE AN ORDER, Agilent offers several options:

1) Visit **http://www.agilent.com/chem/supplies** to place online orders using a purchase order or credit card.
2) Call 1-800-227-9770 (option 1) any weekday between 8am and 8 pm Eastern time in the U.S., Canada & Puerto Rico.
3) To place an order for Consumables, please fax the order to 302-633-8901.
   To place an instrument and/or software order, please fax the order to 302-633-8953.
   To place an order for Genomics, please fax the order to 512-321-3128, or email to orders@agilent.com
4) Or you can mail your order to:
   Agilent Technologies
   North American Customer Contact Center
   2850 Centerville Road BU3-2
   Wilmington, DE 19808-1610

To place an order, the following information is required:

- Purchase order number or credit card, delivery date, ship to, invoice to, end user, and quote number.
- GSA customers please provide GSA contract #.

EXCLUSIVE OFFERS FOR NEW INSTRUMENT CUSTOMERS, go to **www.agilent.com/chem/exclusiveoffers**

TO CHECK THE STATUS OF AN ORDER:

1) Visit **http://www.agilent.com/chem/supplies** to check the status of your order.
2) Call 1-800-227-9770 (option 1) any weekday between 8 am and 8 pm Eastern time, in the U.S., Canada & Puerto Rico. You will need to know the purchase order or credit card number the order was placed on.

FINANCING AND LEASING - A wide range of options are available from Agilent's preferred financing partner, Leasing Group Inc. (LGI).

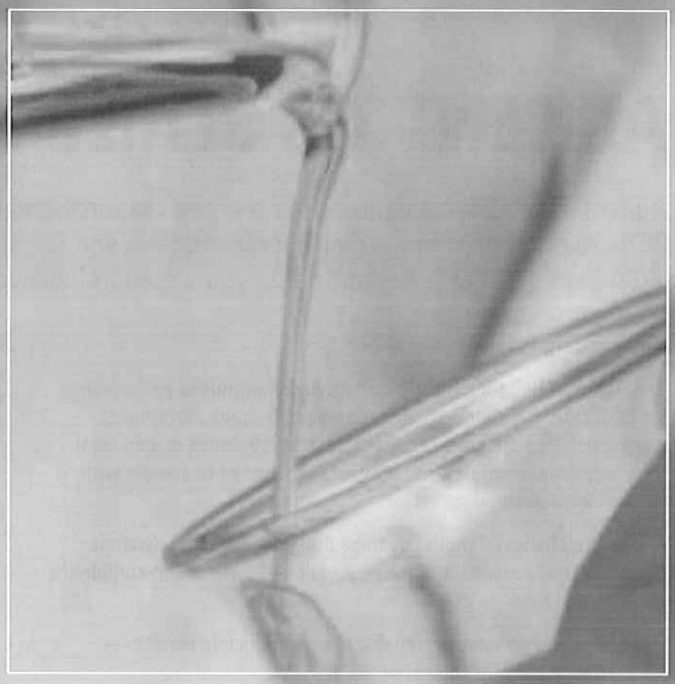
For more information or to discuss how monthly payments could suit your operational or budgetary requirements, contact your Agilent Account Manager or contact LGI at 800-944-1370.

TERMS AND CONDITIONS:

- Pricing: Web prices are provided only for the U.S. in U.S.dollars. All phone prices are in local currency and for end use. Applicable local taxes are applied.
- All Sales Tax is subject to change at the time of order.
- Shipping and Handling Charges: Orders with a value less than $2000 or those requiring special services such as overnight delivery may be subject to additional shipping & handling fees. Some of these charges may be avoided by ordering via the Web
- Payment Terms: Net 30 days from invoice date, subject to credit approval.

* Quotation Validity: This quotation is valid for 60 days unless otherwise indicated.
* Warranty period for instrumentation is 1 year. The Warranty period for columns and consumables is 90 days.

It is Agilent Technologies intent to ship product at the earliest available date unless specified otherwise.



Accurate. Robust. Reliable.

AGILENT 710 SERIES ICP-OES

The Measure of Confidence

Agilent Technologies

AGILENT 710 SERIES ICP-OES

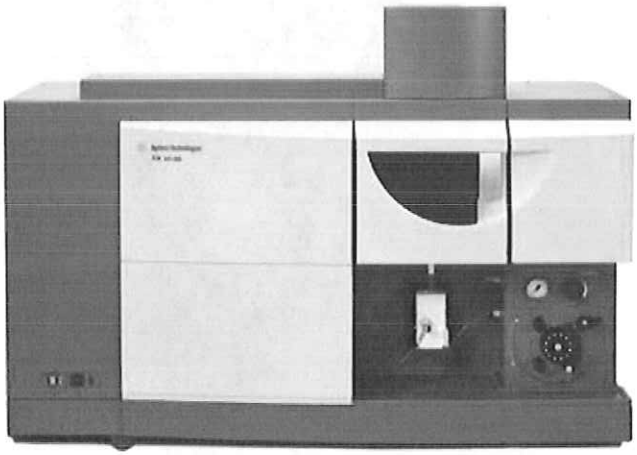
Agilent Technologies is now your premier resource and partner for atomic spectroscopy. With the 2010 addition of Varian's world-renowned AA and ICP-OES products, together with our market-leading 7700 Series ICP-MS, Agilent offers you a comprehensive range of inorganic analytical instrumentation.

Outstanding value

The Aglient 710 Series ICP-OES offers uncompromised performance for laboratories with low to moderate sample loads performing routine ICP-OES analyses. Easy to use, the 710 Series is also ideal for educational institutes and industries that need to comply with WEEE/RoHS directives.

- Continuous wavelength coverage provides extended dynamic range and reduced interferences, giving you maximum confidence in your results
- Robust plasma ensures reliable and reproducible results — even with the most complex matrices
- One view, one step measurement of major, minor, and trace elements, plus the fastest warm-up increases throughput and productivity
- Choice of optimized axial (710) or radial (715) configurations to suit your application needs
- Intuitive, powerful, and easy-to-use software

Agilent is committed to continued product development across our entire range of atomic spectroscopy product lines. We are dedicated to delivering to you innovative technology, best-in-class quality and reliability, and unmatched support.



The Agilent 710 Series ICP-OES features a solid state CCD detector, ideal for laboratories with moderate sample loads that value uncompromised performance.

Agilent

1938 HP is formed

1965 HP enters the gas chromatography market

1976 HP 5992A introduced as the world's first benchtop GC/MS

1983 HP redefines 'reliability' in GC with the introduction of the HP 5890A

1994 Launch of the 4500 Series, the world's first benchtop ICP-MS

2009 Launch of the Agilent 7700 Series ICP-MS featuring Agilent's HMI & ORS³ Cell

2010 Varian becomes a part of Agilent

Varian

1948 Varian Associates is formed

1957 Built components for world's first AA (as Techtron)

1991 Releases first sequential ICP-OES

1994 Axial ICP-OES with cooled cone interface released

1997 Patented Vista chip CCD detector with full wavelength coverage

2006 Launch of the 700 Series ICP-OES — world's fastest ICP-OES

Stable and accurate results for all sample types

With over 6,000 ICP-OES systems worldwide, Agilent's plasma generation is field-proven, robust, and consistently provides stable and accurate results, even with the most challenging samples.

- Superior plasma performance allows direct analysis of samples ranging from organic solvents to industrial waste and brines, minimizing sample preparation times.
- Agilent's innovative cooled cone interface eliminates the use of expensive shear gases, saving you money.
- Advanced optical design with no moving parts and robust plasma generation ensure superb long term stability.
- The CCD detector and optimized optical design give excellent signal-to-noise performance, ensuring low detection limits.
- The dedicated sample introduction system and axially-viewed plasma of the 710 Series ICP-OES provide maximum sensitivity for routine trace-level applications.
- The radially-viewed 715 ICP-OES features efficient sample introduction for maximum robustness, allowing you to analyze the most demanding samples with ease.
- Enhance the performance of the 710 Series with accessories such as the VGA for mercury and hydride forming elements, the fast SPS autosampler for unattended automation, the SVS switching valve for immediate rinsing and improved productivity, the AGM for organic matrices and the USN for lower detection limits with environmental samples.

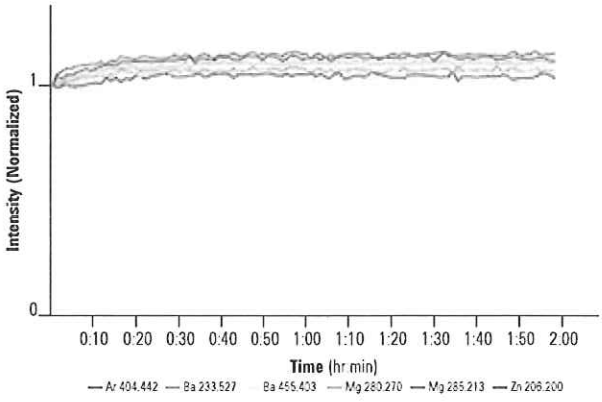
Industry leading performance

Achieve accurate and precise results for low wavelength elements at µg/L levels. Results are shown for toxic elements in polyethylene (European Reference Material EC681) measured on the 710 Series (corrected for 100-fold dilution).

	Certified range mg/kg	Measured value mg/kg
Hg 184.887	4.35 – 4.65	4.60
Cd 214.439	21.0 – 22.4	21.7
Pb 220.353	13.1 – 14.5	13.7
Cr 267.716	17.1 – 18.3	17.5

Fastest warm-up time

Shown is the rapid stabilization of Ar, Ba, Mg, and Zn following plasma ignition. Exceptionally fast warm-up time allows samples to be analyzed in less than 10 minutes after plasma ignition, minimizing delays and saving argon costs.



robust

ONE-STEP ANALYSIS FROM ONE PLASMA VIEW

Productivity and dynamic range for environmental applications

The determination of major, trace and toxic elements in soils, waters, food and agricultural samples is fast and easy using a single plasma view. Agilent's 710 horizontal, axially-viewed plasma provides excellent sensitivity for trace-level determinations, and the flexibility to handle major levels. The robust plasma is able to handle a wide variety of sample matrices while still delivering the best detection limits. Agilent's unique Multi-Cal feature extends the linear range of analysis from parts-per-billion to percentage levels. Unlike dual view systems, the Agilent 710 Series provides extended range without having to analyze the sample twice.

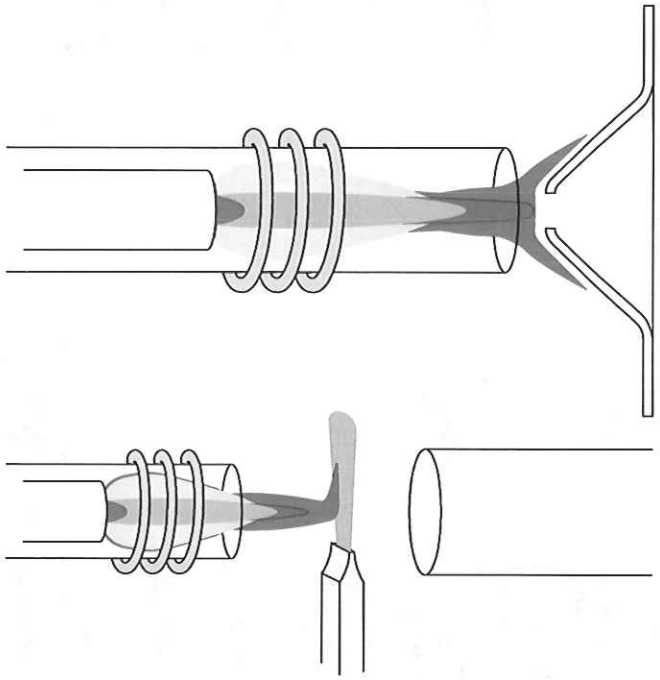
This extended linear dynamic range, coupled with the freedom from interferences offered by the CCD detector, makes the 710 ICP-OES ideal for environmental applications. When combined with microwave digestion the 710 can also be used for routine monitoring of heavy metals in plastic for compliance with RoHS and WEEE regulations.

The 710 axial system meets all US EPA Contract Required Detection Limits (CRDL) for waters and waste waters and is capable of routinely handling up to 5% dissolved salts. The stability, wide linear dynamic range and reduced chemical interferences of the 710 ICP-OES ensure that your laboratory can analyze more samples every day.

Fast, accurate analysis of environmental samples
Measurement of 22 target analytes required for compliance with USEPA ILM05.3 takes only 3 min 34 sec per sample.

Element	NIST 1643e certified (mg/L)	NIST 1643e measured LCS (mg/L)	CRQL (mg/L)	LCS % recovery
Ag 328.068	0.001062	<CRQL	10	–
Al 308.215	0.1418	0.153	200	108%
As 188.980	0.06045	0.0571	10	95%
Ba 585.367	0.5442	0.558	200	103%
Be 234.861	0.01398	0.0136	5	97%
Ca 370.602	32.3	32.3	5000	100%
Cd 226.502	0.006568	0.00650	5000	99%
Co 228.615	0.02706	0.0284	5	105%
Cr 267.716	0.0204	0.0209	50	103%
Cu 324.754	0.02276	0.0217	25	95%
Fe 258.588	0.0981	0.104	100	106%
K 769.897	2.034	2.13	5000	105%
Mg 279.800	8.037	7.85	5000	98%
Mn 257.610	0.03897	0.0409	15	105%
Na 589.592	20.74	21.0	5000	101%
Ni 231.604	0.06241	0.0632	40	101%
Pb 220.353	0.01963	0.0192	10	98%
Sb 206.834	0.0583	0.0591	60	101%
Se 196.026	0.01197	<CRQL	35	–
Tl 190.794	0.007445	<CRQL	25	–
V 311.837	0.03786	0.0361	50	95%
Zn 206.200	0.0785	0.0802	60	102%

Minimize interferences
The Cooled Cone Interface (CCI) efficiently removes the cool plasma tail (the red zone, top) away from the optical path. This minimizes self-absorption and recombination interferences to provide a wide linear dynamic range and low background for the best detection limits. Dual view plasmas (bottom), do not fully remove the cool plasma tail, degrading performance and linear dynamic range.



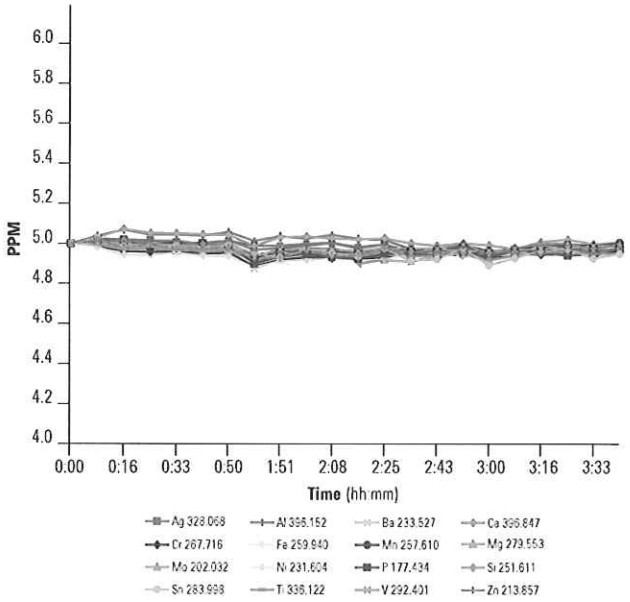
Robust performance for industrial applications

If long term analysis of the most difficult sample types is required, Agilent's 715 ICP-OES offers the benefits of robust operation with minimal maintenance. The radially-viewed plasma is vertically oriented, providing immediate venting of exhaust vapors for reduced injector tube blockage and long term stable performance with high levels of dissolved solids. Vertically orientated, radially-viewed plasma systems are the accepted standard in many industries including chemicals manufacture, salt production, wear metals analysis, petrochemical production and precious metals refining. Dual view plasma systems, which feature horizontal torches, cannot match the rugged, high dissolved salt performance of the 715 ICP-OES.

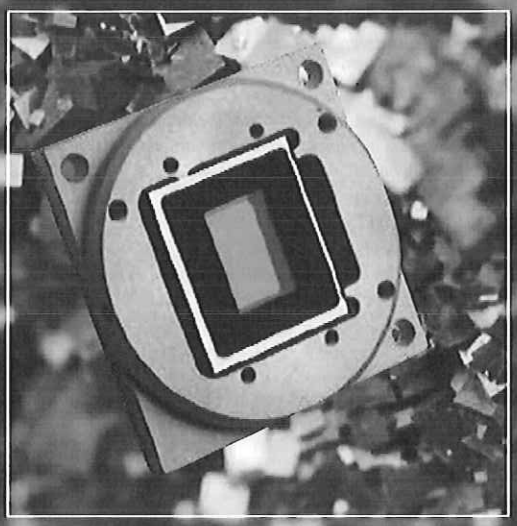
Agilent's robust RF generator system provides the rugged stability needed to ensure excellent long term stability with challenging samples. The radial configuration is also preferred for organic applications as the vertical plasma reduces carbon build up in the injector. Use the programmable viewing height to select the optimum viewing position in the plasma, reduce background, and eliminate interferences from carbon and oxygen based molecular emissions. This means improved detection limits are achieved without the use of oxygen.

Whether you are performing process control in the petrochemical industry, determining major, minor and trace compositions of rocks, soils or sediments, or measuring contaminants in used oils, the 715 ICP-OES offers stable, reliable performance for all sample types.

Stable and reliable performance
Four hour stability study for 5 mg/L S21 elements in directly aspirated kerosene shows the stable and reliable performance of the 715 ICP-OES for difficult organic solvents.



reliable



CLEARLY BETTER SOFTWARE

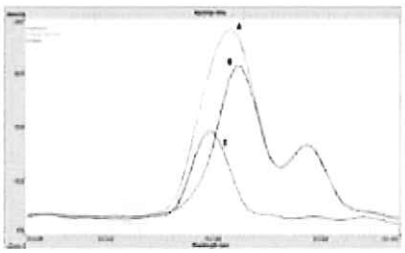
User friendly software with all instrument controls, sample results and signal graphics accessible from one window.

Software designed for real samples

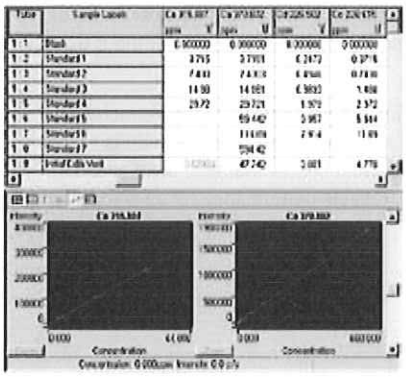
- Easy-to-use worksheet-based software contains wizards and videos to guide you through operation.
- Fitted background correction simplifies method development as you don't need to select correction points manually. This ensures fast method development and better correction.
- Agilent's Fast Automated Curve-fitting Technique (FACT) resolves complex spectral interferences, ensuring greater accuracy in difficult matrices. FACT modeling can be applied post-analysis.
- MultiCal extends the linear range giving you accurate results from a single measurement.
- The status display provides an overview of instrument settings and includes diagnostics for performance optimization and fast fault diagnosis.

Confirm your results automatically

Prove you have accurate results for unknown samples.
With MultiCal you can monitor results at two or more wavelengths for each element — giving you confidence in your results and confirming they are interference free.



Resolve spectral interference with FACT
Resolution of the difficult Fe interference at Cd 214.438 nm. Shown are: a. Appearance of the peaks in a soil sample b. FACT model of the interference (500 mg/L Fe) c. Corrected signal for the Cd analyte.



Extend linear range
With MultiCal, results are automatically assigned either to the Ca 315.887 nm wavelength calibrated to 30 mg/L or the 370.602 wavelength calibrated to 600 mg/L. The Initial Calibration Verification standard is accurately recovered at 47.7 mg/L (%R = 106%).

SIMULTANEOUS ICP-OES

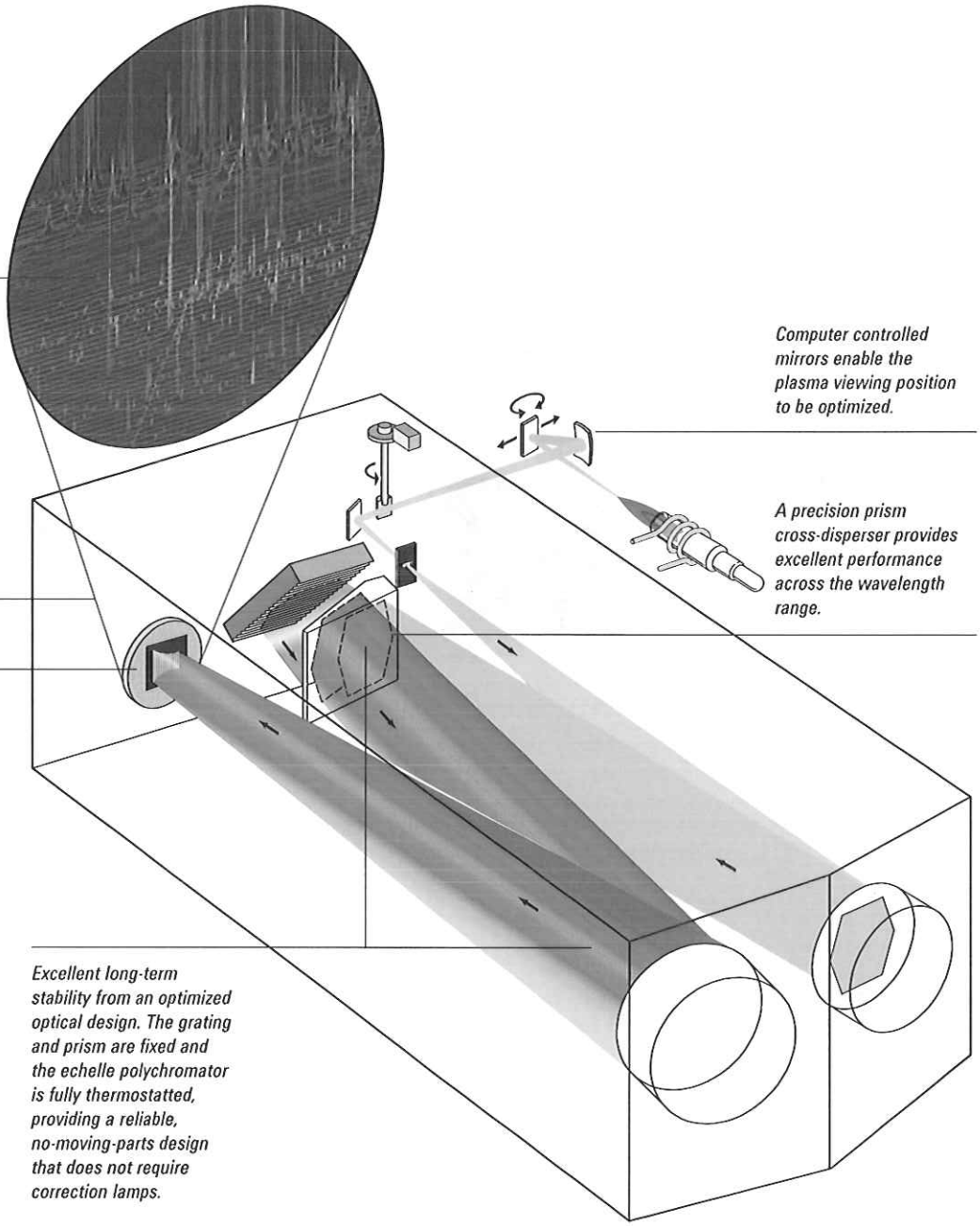
Whether you have tens or hundreds of samples to analyze each day, the Agilent 710 Series ICP-OES will save you time and money.

The detector provides over 1.1 million pixels in a large area, CCD array design. It captures the entire spectral image in one reading, saving you time and reducing running costs. Simultaneous ICP measurement means simultaneous background correction and internal standardization — resulting in more accurate and precise results with excellent long term stability. The unique CCD array detector is cooled to -30 °C for excellent low noise performance and best possible detection limits. For the best value simultaneous ICP-OES, choose the Agilent 710 Series.

The productivity of simultaneous ICP-OES — all wavelengths are captured in one reading without time consuming scanning.

To ensure data integrity and a wide dynamic range the CCD features the Clocked Recombination System (CRS) for anti-blooming protection.

Spectral interferences are easily avoided. Choose any line from 175–785 nm. Good spectral resolution ensures close adjacent wavelengths can be resolved. Unlike dual view ICP-OES designs, the 710 Series covers all the important wavelengths in the visible region without compromise.



Computer controlled mirrors enable the plasma viewing position to be optimized.

A precision prism cross-disperser provides excellent performance across the wavelength range.

Excellent long-term stability from an optimized optical design. The grating and prism are fixed and the echelle polychromator is fully thermostatted, providing a reliable, no-moving-parts design that does not require correction lamps.

THE COMBINED BENEFITS OF TWO LEADERS IN ATOMIC SPECTROSCOPY

With the 2010 addition of Varian, Inc., Agilent now offers an even greater range of instrumentation and the most comprehensive columns and supplies portfolio in the market. Just as important are the best-in-class service and technical support teams, focused on finding solutions for our customers. Agilent is here to provide the technology — and *the Measure of Confidence* — you need to be successful.

An expanded portfolio of solutions from the leader in ICP-MS

The range of Agilent AA, ICP-OES and ICP-MS instruments offers unmatched performance, and the highest level of reliability and ease-of-use. The instruments are backed by a combined global network of dedicated and experienced support staff.

Agilent 7700 Series ICP-MS offers unmatched matrix tolerance and interference removal, and the smallest footprint of any ICP-MS.

Agilent's AA range includes the world's fastest flame AA and the world's most sensitive furnace AA.

Our catalog of new applications is ever growing.

To learn about the latest, contact your local Agilent Representative or visit us at:
www.agilent.com/chem/

Find out how Agilent's Atomic Spectroscopy Solutions can deliver the productivity, reliability and accuracy you need.

Learn more: **www.agilent.com/chem**

Buy online: **www.agilent.com/chem/store**

Find an Agilent customer center in your country:
www.agilent.com/chem/contactus

U.S. and Canada
1-800-227-9770
agilent_inquiries@agilent.com

Europe
info_agilent@agilent.com

Asia Pacific
adinquiry_aplsca@agilent.com

Availability of chemicals dependent upon import restrictions.
This information is subject to change without notice.

Printed in U.S.A., September, 2010
5990-6496EN

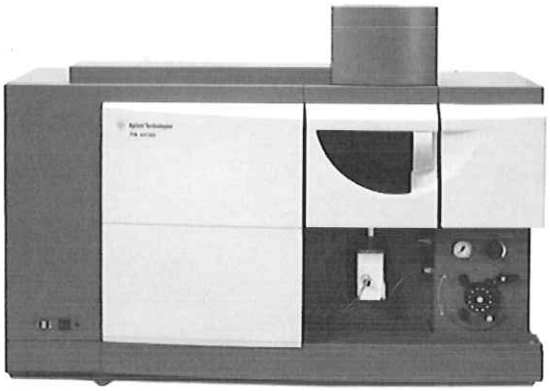
The Measure of Confidence

Agilent Technologies

Agilent 710 Series ICP-OES

Accurate. Robust. Reliable.

Specifications



Introduction

Agilent 710 Series ICP-OES spectrometers are manufactured according to a quality management system certified to ISO 9001.

Design overview

The Agilent 710 and 715 ICP-OES systems are compact, bench-mounted simultaneous Inductively Coupled Plasma Optical Emission Spectrometers (ICP-OES) with full PC control of instrument settings and compatible accessories. They feature an innovative megapixel CCD detector designed specifically for ICP-OES and provide complete wavelength coverage from 177–785 nm.

Agilent ICP-OES systems are available in either axially (710) or radially (715) viewed configurations and include a free-running, air-cooled 40 MHz RF generator with solid-state HV power supply, purged echelle polychromator and full PC control of plasma viewing position and plasma gas flows. Fully web-integrated ICP Expert II software uses Agilent's worksheet concept for ease of use, rapid operator training, and commonality with Agilent Atomic Absorption products.

Instrument hardware

Sample introduction

Choice of optimized axial (710) or radial (715) configurations to suit your application needs.

- 715 includes an inert and robust, double-pass cyclone spraychamber and V-groove nebulizer as standard
- 710 includes a high sensitivity glass, single-pass cyclone spraychamber and Conikal nebulizer as standard
- Fully PC-controlled peristaltic pump, variable speed from 0–50 rpm, three channels for sample, drain and internal standard/ ionization buffer
- Optional semi and fully-demountable torches with choice of glass or ceramic injector tubes, high solids torch and all-glass sample introduction system.

Gas control

Plasma and auxiliary gas flows are software controlled using switched flow controllers. The system is fully interlocked against gas failure.

- Nebulizer gas: software enabled with choice of flow control using a high precision pressure regulator, or computer controlled using mass flow control. MFC provides flow range 0–1.3 L/min in 0.01 L/min increments
- Plasma gas: 0–22.5 L/min in 1.5 L/min increments
- Auxiliary gas: 0–2.25 L/min in 0.75 L/min increments

RF generator

- 40 MHz free-running, air-cooled RF generator. Power output of 700–1700 W in 50 W increments. Optimum power settings defined and stored within each method for different sample types
- Over 75% RF coupling efficiency
- Automatic ignition and shutdown with user-customizable ignition sequence
- Power output stability is better than 0.1%

Plasma configuration

Radially viewed system (715 ICP-OES)

Vertically oriented, radially viewed plasma is ideal for the most difficult of applications, including the analysis of oils and organic solvents, geological/metal digests and high TDS solutions e.g., brines. Includes full PC control of plasma viewing height from 0-20 mm and horizontal adjustment of ±3 mm to optimize sensitivity and minimize interferences. Viewing height may be adjusted under PC control for each wavelength of interest.

Axially viewed System (710 ICP-OES)

Horizontally oriented, axially viewed plasma is ideal for high sensitivity analyses. Provides a 2–8 fold improvement in detection limits compared to radial viewing. The axially viewed plasma system features a unique Cooled Cone Interface (CCI) to prevent the cooler plasma tail from being viewed by the optics. This reduces interferences, improves the system's tolerance to high dissolved solids and extends the linear dynamic range compared to conventional axial systems.

The CCI is a superior plasma interface with lower running costs compared to shear gas systems. Includes full X, Y adjustment of plasma viewing position under PC control.

Agilent 710 Series ICP-OES

Instrument hardware

Optical system

- Computer-optimized echelle optical design with no moving optical parts ensures lowest detection limits and maximum stability
- 400 mm focal length polychromator is thermostatted to 35 °C for excellent stability. Features a precision prism cross disperser and echelle grating (94.74 lines/mm) creating an echellogram (of 70 orders) that is projected onto the megapixel CCD detector
- Standard polychromator purge of 0.75 L/min with PC controlled 3 L/min boost purge for operation with emission lines having wavelengths below 185 nm. Can be purged with either argon or nitrogen (requires optional nitrogen purge kit)

Megapixel CCD detector

- Innovative megapixel CCD detector features 1.12 million pixels, each 15 µm x 15 µm in an X-Y grid array for full wavelength coverage from 177 nm to 785 nm. The detector is thinned and back illuminated for enhanced Quantum Efficiency (QE) in the UV. The detector is mounted on a two stage Peltier device and cooled to -30 °C for low dark current and noise
- Auto Integration allows intense and trace signals to be measured simultaneously at the optimum signal-to-noise ratio, providing lowest possible detection limits and preventing over-range signals – more intense peaks are allocated shorter integration times and less intense peaks are allocated longer times
- The megapixel CCD detector features anti-blooming protection on each pixel. This enables the simultaneous measurement of trace level analytes in the presence of nearby intense signals

Instrument software

Features

ICP Expert II is an easy-to-use, web-integrated instrument software package. It features wizards that guide users through method and sequence development and method templates for rapid development of commonly used methods.

- Computer control of plasma gas flows, plasma viewing position, ignition, RF power, safety interlocks and utilities monitoring
- Choice of background correction techniques from traditional off-peak background correction to unique fitted background correction
- Fast Automated Curve-fitting Technique (FACT) for online spectral deconvolution of complex spectra
- MultiCal assists in extending linear dynamic range and automatic validation of results
- Number of replicates measured can be set by solution type (calibration standards, QC solutions, samples)
- Calibration routines for multi-element external calibration and method of standard addition
- Calibration reslopes eliminate the need for full re-calibration
- User-customizable Quality Control Protocols (QCP) designed to meet US EPA and other international compliance standards
- Fully editable sample label list with optional customer and batch label fields
- Weight/volume/dilution correction factors with user-definable concentration units conversion for samples and calibration/QC solutions
- Autosampler rack and tube positions can be edited for true random access sampling
- Sequence options include calibration/reslope/QCP error actions and end of analysis actions

Instrument software

Features

- Calibrations can be programmed at a user-specified rate either inline with sample tubes or from centralized calibration tubes (rate-driven)
- Microsoft's SQL Server 2005 Express for secure storage and fast retrieval of results
- Real-time graphical display of signal spectra, results and calibration graphs
- Post-run retrospective data editing
- Wide variety of reporting and exporting options with user-defineable settings
- Graphical display of system status and comprehensive set of instrument diagnostic tools
- Comprehensive help system, including multimedia and video assistance

Analytical performance

Warm-up time

Warm up time from standby mode <10 mins from plasma ignition.

Stray light

Stray light elimination via baffles and optical design to less than 2.0 mg/L effective As signal at 188.980 nm from 10 000 mg/L Ca.

Signal stability

Typically stable to less than 1% RSD over 8 hours without internal standardization or any form of drift correction.

Typical resolution (FWHM)

Element	Wavelength (nm)	Resolution (pm)
As	188.980	<9
Mo	202.032	<9
Zn	213.857	<10
Cr	267.716	<13
Cu	327.396	<19
Ba	614.172	<45

Agilent 710 Series ICP-OES

Analytical performance

Typical detection limits

3 sigma detection limits (µg/L) using a 30 second integration time

Element	Wavelength (nm)	715 radial (µg/L)	710 axial (µg/L)	Element	Wavelength (nm)	715 radial (µg/L)	710 axial (µg/L)
Ag	328.068	1	0.5	Mg	279.553	0.1	0.02
Al	396.152	4	0.9	Mn	257.610	0.15	0.05
As	188.980	12	2	Mo	202.032	2	0.5
Au	242.794	5	1	Na	589.592	1.5	0.2
B	249.772	1.5	0.3	Ni	231.604	2.1	0.7
Ba	455.403	0.15	0.03	P	177.434	15	3
Be	313.107	0.15	0.03	Pb	220.353	8	1.5
Bi	223.061	10	2.5	S	181.972	13	4
Ca	396.847	0.3	0.01	Sb	206.834	15	3
Cd	214.439	0.5	0.08	Se	196.026	16	4
Ce	418.659	7	2	Si	251.611	5	2
Co	238.892	1.2	0.3	Sn	189.927	10	1.6
Cr	267.716	1	0.2	Sr	407.771	0.1	0.02
Cu	324.754	1.5	0.5	Ti	334.941	0.5	0.15
Fe	238.204	0.9	0.2	Tl	190.794	10	2
Hg	184.887	2.5	0.9	V	292.401	2	0.5
K	766.491	4	0.3	Zn	213.857	0.8	0.2
Li	670.783	1	0.06	Zr	343.823	1.5	0.3

Accessories

Autosampler

- Agilent SPS 3 high throughput autosampler, with fast X, Z, theta arm movement
- Capacity for up to three sample racks and two standard racks. Racks may be exchanged during analysis for unlimited sample capacity
- Fully compatible with optional online diluter
- Compatible with a wide range of commercially available, autoclavable, laboratory racks

Diluter

- Optional precision syringe auto-diluter for Agilent SPS 3, performs automatic online over-range dilution and automatic off-line sample and calibration solution preparation using optional Roboprep software

Automatic online dilution

- Online dilution of over-range elements with user-definable dilution and mixing options
- Serial dilution of samples until analyte results are in-range
- Combine with MultiCal to further extend the linear dynamic range

Accessories

Intelligent off-line solution preparation

- Optional RoboPrep software utility allows off-line dilution and preparation of samples and standards
- Provides customization of rack configurations to allow dilution of samples directly in digestion racks
- Includes capabilities for preparation of multi-element calibration standards, sample spiking and standard addition

Productivity package

- Four port Switching Valve System (SVS 1) immediately rinses the sample introduction system while the next sample is being introduced to the instrument
- Reduces carry-over, increases sample throughput and decreases cost per analysis

Ultrasonic nebulizer

- USN increases nebulization efficiency typically providing an order-of-magnitude improvement in detection limits

Vapor generation

- Modular continuous flow vapor generator for the determination of Hg, As, Se, Sb, Te, Bi, and Sn at µg/L and ng/L levels
- Compatible with the Agilent SPS 3 autosampler

AGM 1

- Controls addition of oxygen to the plasma to prevent carbon deposition and reduce background structure when analyzing organic solvents. Recommended when determining organic solvents using the axially-viewed ICP-OES

Volatile organics kit

- Includes a water-cooled spraychamber and demountable torch with 0.8 mm ID injector for the analysis of volatile organics such as gasoline and naptha
- Requires, but does not include a suitable water cooler. The AGM 1 for controlled addition of oxygen to the auxiliary gas is also recommended

Torches, nebulizers and spare parts

Agilent offers a range of torches, nebulizers, spraychambers, tubings and other spares parts. Refer to our Web site for details.

Agilent 710 Series ICP-OES

Installation requirements

System installation	
	For details of ICP-OES installation requirements refer to the Pre-installation manual, publication number 8510233700.

Customer support policies

Warranty	
	Twelve (12) months, though this may vary according to location.
Hardware support period	
	Seven (7) years from date of last unit manufacture. After this time, parts and supplies will be provided if available.
Software support	
	Telediagnostic capability is available for some instrument models. Availability of Telediagnostic support may vary according to location. Software upgrades to fix nonconformances or safety problems will be issued free of charge. Software upgrades to add additional functionality will require an additional fee.
Online user group	
	All Agilent ICP-OES users can join our free email users group, PlasmaNet, which has access to Agilent ICP-OES users and Agilent support staff worldwide.

Further details

More information	
	For further information please consult your Agilent office or supplier, or our Web site at www.agilent.com

www.agilent.com/chem

Published November 26, 2010
Publication number: 5990-6712EN

The Measure of Confidence

Agilent Technologies

Key Features of Agilent 710/715 Simultaneous ICP

- Agilent is the ONLY ICP vendor that has eliminated the need for sequential ICPs. We ALONE, can give you the same wavelength flexibility that sequential units offer on simultaneous solid state chip detector ICP. All other manufacturer's simultaneous solid state chip detector ICPs cannot go to any wavelength, as our's or a sequential ICP can. This means that for future analyses, you will be assured the best of both worlds (e.g. speed of state-of-the-art simultaneous solid-state chip ICP and full wavelength flexibility of a sequential ICP).
- Agilent is only CCD ICP vendor that has given users the same big advantage that a CID ICP has, namely the ability to change integration times in situ. This is done by multi-framing collection technique on the Varian 710/715 ICP, which is equivalent to the best feature of the non-destructive CID ICP detector system.
- Agilent's ONE VIEW eliminates the need for dual (e.g. combination radial/axial ICP) view ICPs. Since dual view as done to expand the linear dynamic range(e.g. do high and low concentrations at same time), the Agilent 710/715 ICP with it's ability to calibrate/collect data at various wavelengths for same element, yields linear dynamic ranges greater than any dual view instruments. **Another benefit of NOT needing dual view is that the analysis will be quicker**, since only one reading will be taken, as compared to dual view instruments, which take one analysis in axial view and another view in the radial view.
- Agilent is ONLY vendor to offer a simultaneous ICP with a solid-state detector that has ELIMINATED wavelength blooming. This means that Agilent has engineered a detector system that will NOT allow for the saturation of ANY pixel on the detector, thus eliminating spillage into the next pixel giving an erroneous response for that element, that corresponds to the pixel that has received the spillage of light. On all other vendors instruments blooming has only been addressed by recognizing this saturation and requiring re-analysis of sample.
- The Agilent ICP is based on CCD detector technology, that is the most accepted technology of today and in the future. This is based on the fact that 90 % or more of all solid state chip instruments being sold today and in the past 5 years are CCD chip instruments. Only one instrument company sells CID detector systems and the odds are that this detector will be obsolete in a very short time.
- FACT Spectral Deconvolution yields the best possible resolution of any solid state detector
- Thermostatted Optics, which yields the best stability in holding calibration
- RF and Gas Box, yield most efficient plasma(e.g. ability to change with respect to matrices such as particulates/organics/etc.) in market place today.
- Software similar on all product lines, user friendly, and easy to work.
- Detection Limits excellent (e.g. Pb~ 1 ppb on axial unit)
- Speed equal to better than all other vendor's solid state detector instruments
- 710/715 ICP has sealed camera, so do not need filter replacement
- 710/715 has unique CCD detector which has 1.2 M pixels

Agilent ONE VIEW Explanation

Agilent Technologies offers a unique and patented axial interface called our Cooled Cone Interface (CCI) that has allowed Agilent to eliminate the need for **Dual View** of the plasma. The CCI offers faster analysis, reduced gas consumption, lower operating costs and simpler operation than other designs.

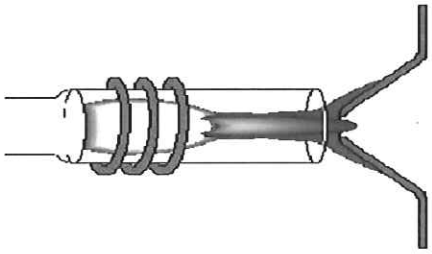
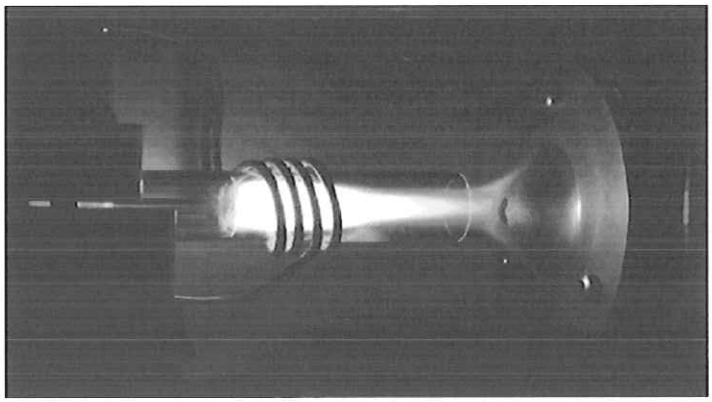


Diagram of the Agilent CCI

The Agilent CCI offers a patented interface which removes the cool tail of the plasma where recombination and interferences may occur and allows the analysis of minerals and heavy metals from a single view. This is accomplished by separating the tail of the plasma over the cone, removing it from view. This is important because the cooler tail of the plasma is where interferences occur and non linearity of a calibration is observed. We are able to do this without the requirement of a shear gas, air knife, high extraction exhausts or dual view.



Agilent Cooled Cone Interface at work!

The Agilent design does *NOT require the added expense of a high shear* gas flow rate (which requires an additional 20+ liters or air, nitrogen or argon per minute), does not require an enormous exhaust rate (some require 20 miles per hour in the exhaust) or the need to view the sample twice (which makes the analysis twice as slow).

A properly designed simultaneous ICP should have as few moving parts as possible and be able to simultaneously acquire and calculate not only primary emission lines of each element but also the alternate lines of each element. *The Agilent CCI creates an air free path between the plasma and the optics, leading to greater sensitivity for UV elements, which does not occur in dual view systems.*

The Agilent 700-ES series offers the best sensitivity and greatest linearity of any other ICP-OES system. This is possible by analyzing for multiple wavelengths of the same element. Utilization of just one calibration for analysis may not be able to accurately determine the amount of an element present over an extensive concentration range. Calibrating on the most intense line will lead to excellent sensitivity and calibrating on an alternate less sensitive line will allow for very high concentrations to be determined.

These various lines will have different sensitivities and by using a combination of these lines, it is possible to use very sensitive lines with less sensitive lines. This is called **MultiCal**, and will allow for an extended linear range by allowing you to use more than one calibration graph for the same element in the analysis. The first calibration may use a sensitive line with a concentration range of 0–50 mg/L. The second calibration may use a less sensitive line with a concentration range of 50–2000 mg/L or beyond.
MultiCal allows the analysis of any element from detection limit to % levels all in a single analysis. This is possible because the Agilent ICP-OES systems are specifically designed with our CCI and custom CCD detector.

MultiCal is built into the ICP Expert II Software and offers several advantages:

- Combine wavelengths based on mean, weighted mean, minimum or median
- Produces one combined result for each element/sample – automatically !
- Extends linear dynamic range by calibration with λ of different sensitivity
- Improved productivity as no need to dilute sample or reread in "another view"
- Reduces sample consumption, reduces Ar consumption

MultiCal also gives you confidence in the accuracy of results by monitoring at two or more emission lines for each element for real time results confirmation.

Sample Labels	Ca mg/L e	K mg/L e
Blank	0.000000	0.000000
Standard 1		
Standard 2	1.0000	1.0000
Standard 3	10.000	10.000
Standard 4	20.000	20.000
Standard 5	50.000	50.000
Standard 6	100.00	100.00
Standard 7	200.00	200.00
Standard 8	500.00	500.00
Standard 9	1000.0	1000.0
Standard 10		2000.0
CCV 50	50.425	50.266
CCV 500	501.86	505.92

MultiCal Software allows seamless joining of wavelengths and minimizing dilutions!

Sample Labels	Fe 262.567 ppm U	Fe 263.132 ppm U
RMHRD 876 STD .1508	375.079	375.033

Demonstration of MultiCal at work: confirming results!

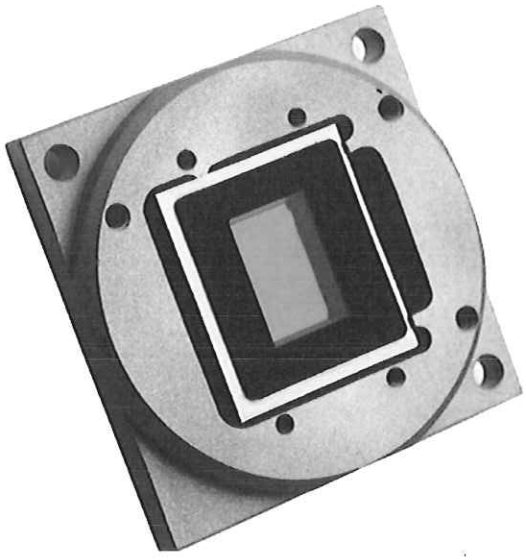
Since Dual View systems are always horizontal in their torch orientation and must view the plasma in two orientations for each sample analysis, these designs lead to an increase in analysis time, a greater gas usage and an increase in maintenance problems due to mechanical wear. In addition, shear gas or air knife systems require the user to optimize the position of the shear gas for each sample matrix. Also dual view systems require a slit in the torch for the side viewing, which will lead to decreased torch lifetimes.

In summary, Agilent 700-ES series uses our patented CCI to increase linear dynamic range and eliminate interferences, other manufactures use a Dual View system to increase linear dynamic range and eliminate interferences. Both approaches work, the Agilent 700 series approach is more economical in Argon use, offers truly simultaneous measurement and does not require any moving parts.

Agilent's service and technical support organization is large in your area and we have worked hard to provide a level of responsiveness that differentiates us from other instrument manufacturers.

700-ES ICP-OES Instruments

710/715-ES Solid State CCD Detector



The custom CCD detector in the 710/715-ES series provides unparalleled advances in performance. Combined with a compact, thermally stabilized Echelle polychromator, the CCD gives complete flexibility in wavelength selection to avoid spectral interferences, and increase linear dynamic range. A built-in wavelength library features 33,000 lines but you can choose any line you like ensuring that you meet your needs now, and in the future.

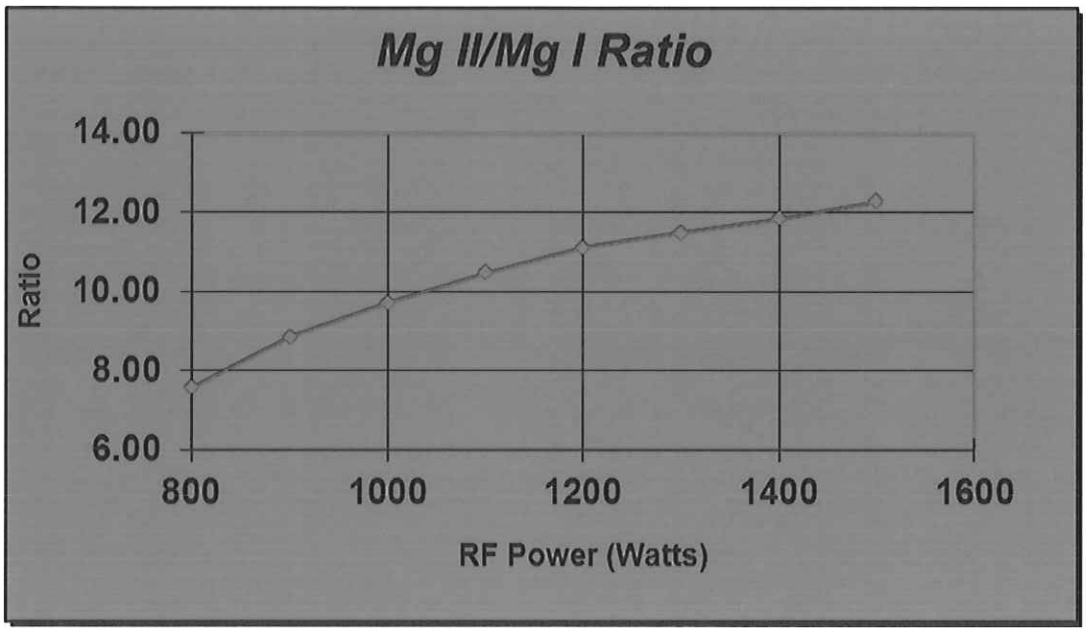
Agilent's CCD detector provides full and continuous wavelength coverage over the wavelength range. The CCD also features anti-blooming protection on every pixel, ensuring trace analytes can be accurately measured in the presence of high concentrations of other elements.

The unparalleled detection limits and linear dynamic range of the CCD allow one-step analysis from a single plasma view. Only Agilent offers superior dynamic range and detection limits using:

- ✓ **Auto-Integration Technology™ prevents over-range signals by adjusting the measurement time automatically for each wavelength to achieve the optimum signal-to-noise ratio.**
- ✓ **Processing electronics are off-chip for excellent Quantum Efficiency with no need for a phosphorescent coating.**
- ✓ **Dual stage Peltier cooling to -30°C provides very low background noise.**
- ✓ **Over 33,000 wavelengths available at any time (no mapping of the CCD is ever needed).**
- ✓ **Simultaneous measurement of background and internal standards ensure the best precision and accuracy.**

700-ES ICP-OES Instruments

40 MHz RF Generator



Agilent's robust 40.68 MHz free-running design offers many advantages:

- ✓ **Excellent MgII/MgI ratio**
- ✓ **Air-cooled, no moving parts high reliability**
- ✓ **Direct Serial Coupling, DISC**
- ✓ **Power output stability is better than 0.1 %**
- ✓ **Excellent performance with organics and high dissolved solids matrices**
- ✓ **Volatile solvents and high dissolved solid samples DO NOT extinguish the plasma**

The Agilent family of ICP-OES systems offers a free-running RF generator with the power control system directly coupled to the induction coil to rapidly adjust to changes in the plasma impedance for improved stability. With Direct Serial Coupling (DISC), Agilent has improved the transfer efficiency of RF energy into the plasma by eliminating inefficient secondary matching networks. The result is a RF system that produces stable plasma and is tolerant to organic solvents and other difficult to analyze samples.

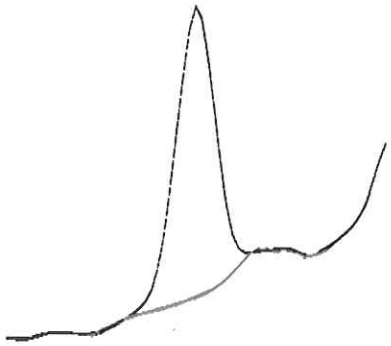
This design eliminates the need for tuning capacitors in the matching network—which eliminates all moving parts in the RF system resulting in high up-time, reliability and lower cost of ownership. As a result, the Agilent RF system produces robust and stable plasma, suitable for the direct analysis of samples ranging from organic solvents to industrial wastes and concentrated brines. Unlike crystal locked designs, Agilent's free running RF generator responds instantaneously to changes in the plasma impedance for superior stability.

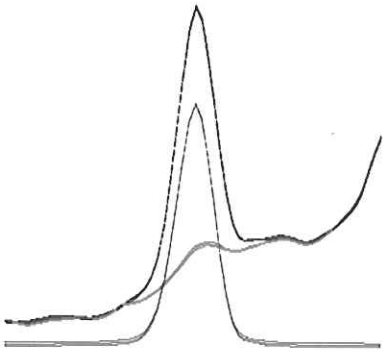
700-ES ICP-OES Instruments

Background Correction Techniques

Automatic (Polynomial Fitted Technique)

In this mode, background correction is automatically performed without any user input. The system makes use of a polynomial slope-estimating algorithm to determine the background correction positions. The algorithm identifies positions around the scan peak where the slope of one side of the peak is less than or equal to the slope of the other side of the peak. This process selects background correction points outside the peak wavelength range. Points around these positions are fitted to a curve, which is used to predict the background signal at the analyte wavelength. This is then subtracted from the analyte signal. If you choose this option, the peak shaped functions will be fitted to the analyte peak, automatically.



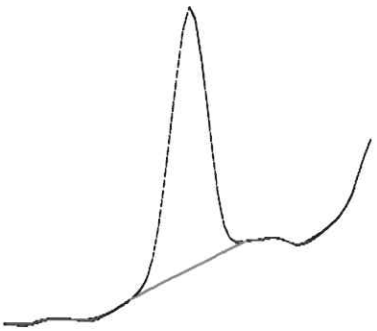


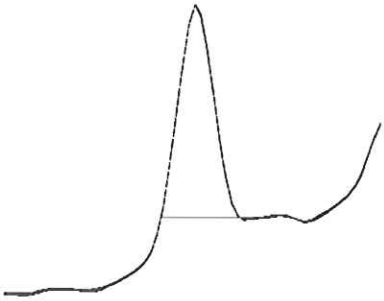
FACT (Fast Automated Curve-Fitting Technique)

FACT is a peak modeling approach that uses spectral data from analyte and interference standards to deconvolute the analyte peak from nearby interference peaks. Using the FACT wizard, you will measure pure analyte, blank, and interference solutions. Once you are satisfied with a particular spectrum for each model, these are saved and stored in the method. You can then test the outcome of the FACT modeling as part of the wizard. During the subsequent analysis, each spectrum measured is fitted using the models. Here, the green peak represents the analyte peak with FACT applied, note how the complex structured background has been completely corrected.

Offpeak BC–Left & Right Together

The Left & Right option will define two background correction positions (one on either side of the analyte peak) for sloping background. A linear interpolation is performed between the two background points to predict the background intensity at the analyte wavelength, which is then subtracted from the analyte signal. If you select this option, you can set the two background correction positions in the Left and Right Offset fields that will appear.



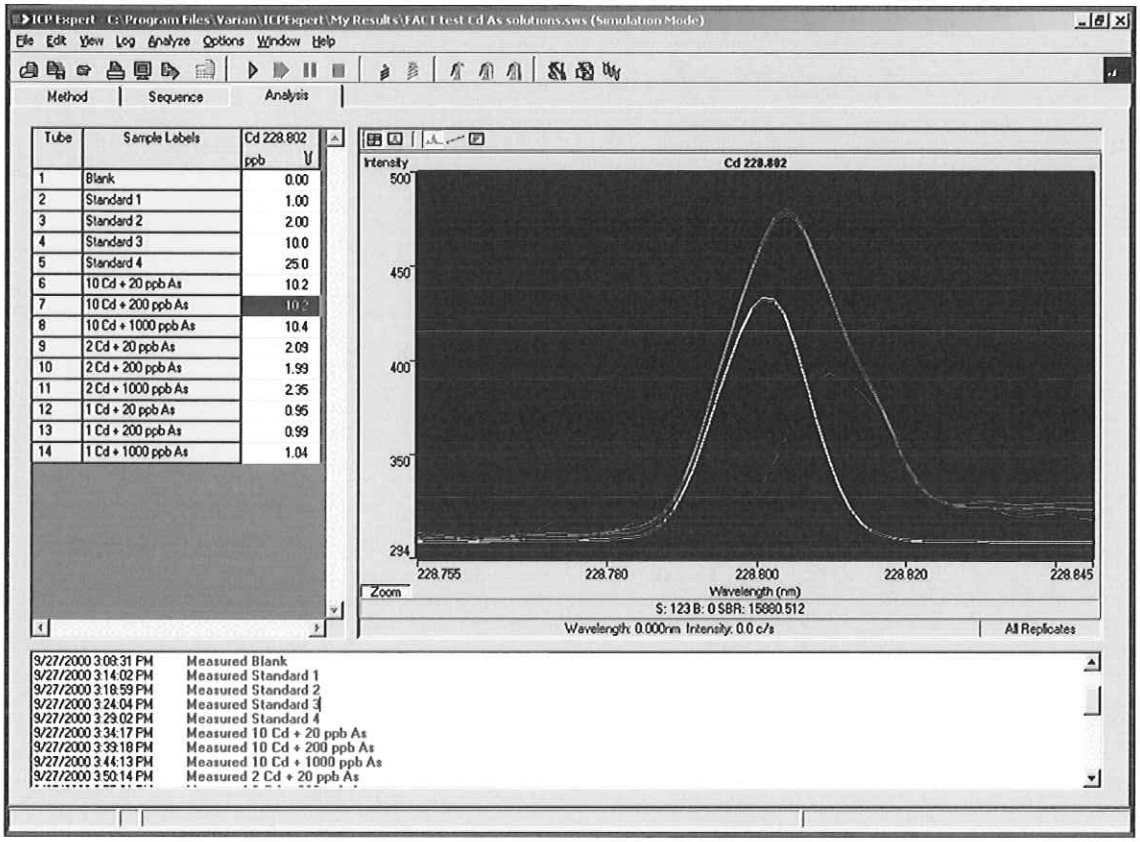


Offpeak BC–Left or Offpeak BC–Right Only

Offpeak BC-Left defines a single background correction point on the left side of the analyte peak. You should place the background point where the background is flat. The intensity of the signal at this point is measured and subtracted from the signal intensity at the analyte wavelength. Offpeak BC-Right defines a single background correction point on the right side of the peak, where the background is flat. The intensity of the signal at this point is measured and subtracted from the signal intensity at the analyte wavelength.

700-ES ICP-OES Instruments

Fast Automated Curve-fitting Technique (FACT)



You can use Point Sum background corrections or ICP Expert's own Fast Automated Curve-fitting Technique (FACT) to apply corrections. All background correction techniques can be reprocessed after data has been acquired. FACT quickly provides real-time spectral correction without the need for further background correction. FACT is an automated procedure, which uses a wizard to step you through the correction process, allowing you to deconvolute the analyte peaks. The FACT Wizard is accessed from the Corrections dialog box by selecting FACT as the Mode option.

FACT is a peak modeling approach that uses spectral data from analyte and interference standards to deconvolve the analyte peak from nearby interference peaks. Using the FACT wizard, you will measure pure analyte, blank, and interference solutions. Once you are satisfied with a particular spectrum for each model, these are saved and stored in the method. You can then test the outcome of the FACT modeling as part of the wizard. During the subsequent analysis, each spectrum measured is fitted using the models. The component due to the analyte peak model is then used to calculate the analyte intensity.

Agilent 700 Series ICP Optical Emission Spectrometers

Preinstallation Manual

Agilent Technologies

Notices

Manual Part Number

8510233700

Edition

Fourth edition, July 2011

Printed in Australia

Agilent Technologies, Inc.

Warranty

The material contained in this document is provided "as is," and is subject to being changed, without notice, in future editions. Further, to the maximum extent permitted by applicable law, Agilent disclaims all warranties, either express or implied, with regard to this manual and any information contained herein, including but not limited to the implied warranties of merchantability and fitness for a particular purpose. Agilent shall not be liable for errors or for incidental or consequential damages in connection with the furnishing, use, or performance of this document or of any information contained herein. Should Agilent and the user have a separate written agreement with warranty terms covering the material in this document that conflict with these terms, the warranty terms in the separate agreement shall control.

Technology Licenses

The hardware and/or software described in this document are furnished under a license and may be used or copied only in accordance with the terms of such license.

Restricted Rights Legend

If software is for use in the performance of a U.S. Government prime contract or subcontract, Software is delivered and licensed as "Commercial computer software" as defined in DFAR 252.227-7014 (June 1995), or as a "commercial item" as defined in FAR 2.101(a) or as "Restricted computer software" as defined in FAR 52.227-19 (June 1987) or any equivalent agency regulation or contract clause. Use, duplication or disclosure of Software is subject to Agilent Technologies' standard commercial license terms, and non-DOD Departments and Agencies of the U.S. Government will receive no greater than Restricted Rights as defined in FAR 52.227-19(c)(1-2) (June 1987). U.S. Government users will receive no greater than Limited Rights as defined in FAR 52.227-14 (June 1987) or DFAR 252.227-7015 (b)(2) (November 1995), as applicable in any technical data.

Safety Notices

CAUTION

A **CAUTION** notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in damage to the product or loss of important data. Do not proceed beyond a **CAUTION** notice until the indicated conditions are fully understood and met.

WARNING

A WARNING notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in personal injury or death. Do not proceed beyond a WARNING notice until the indicated conditions are fully understood and met.

Request for Installation

All preparations have been completed. Please arrange for the installation to be completed as soon as possible. I understand that if the installation site is not prepared in accordance with the enclosed instructions, additional installation charges may apply.

Company name: _____

Company address: _____

_____

_____

Name: _____

Position: _____

Telephone: _____

Preferred installation date: _____

Signed: _____

Date: _____

Pre-Installation Checklist

Your site must meet all requirements before you request installation. Before unpacking the boxes, complete each requirement listed in the table. After completing each requirement, place a check in the appropriate check box. Ensure you compare each item inside the boxes with the packing list supplied with the boxes.

Requirements	☑
Principal installation area is in compliance with all relevant safety regulations.	☐
Laboratory temperature is maintained between 20 and 25 °C (68 and 77 °F).	☐
Laboratory is free of excessive particulate matter.	☐
Cooling air system is set up (if required).	☐
Workbench requirements are met.	☐
Sufficient bench space is available for all components.	☐
Bench can support system weight.	☐
Personal computer with Microsoft® Windows® XP is installed and printer is set up.	☐
Entrance to the lab is at least 2200 cm (86.6 in) wide.	☐
Instrument is unpacked and placed on workbench.	☐
Exhaust system is suitable.	☐
Specified electrical supply and power outlets are installed.	☐
Gas supply (at specified purity), regulator, and gas lines are installed for argon and optional nitrogen.	☐
Water cooling/circulation system and power connections are set up.	☐
Waste container appropriate for the chemical waste is prepared.	☐
Accessories	
SPS Sample Preparation System	☐
SVS 1 Switching Valve System	☐
VGA Vapor Generation Accessory	☐
Auxiliary Gas Module (AGM 1)	☐

Contents

1. Safety Practices and Hazards

General

Operation of an Agilent 710/715/720/725/730/735 ICP Optical Emission Spectrometer involves the use of compressed gases, high voltage radio frequency energy and hazardous materials including corrosive fluids and flammable liquids. Careless, improper or unskilled use of this spectrometer can cause death or serious injury to personnel, and/or severe damage to equipment and property. Only trained personnel should use this instrument.

The spectrometer incorporates interlocks and covers that are designed to prevent inadvertent contact with any potential hazards. If the instrument is used in any manner not specified by Agilent, this protection may be impaired. It is good practice to develop safe working habits that do not depend upon the correct operation of the interlocks for safe operation. It is essential that no interlock or cover is bypassed, damaged or removed.

The safety practices described below are provided to help the user operate the instrument safely. Read each safety topic thoroughly before attempting to operate the instrument and *always* operate the spectrometer in accordance with these safety practices.

Plasma

The plasma is extremely hot (about 10,000 K) and radiates dangerous levels of radio frequency (RF) and ultraviolet (UV) energy. The work coil operates at 1,500 V RMS and about 40 MHz. Exposure to the RF and UV energy can cause severe skin damage and cataracts of the eyes, while close contact with the operating plasma can result in severe heat burns to the skin, and an electrical discharge that can jump a considerable distance and may cause death, severe electric shock or sub-surface skin burns.

The plasma must *never* be operated unless:

- the torch compartment door is closed, with the locking lever fully latched; and
- the space above the chimney is clear of objects.

The shielding around the torch compartment is designed to reduce UV, visible and RF radiation to safe levels while still permitting easy access to, as well as installation and viewing of, the torch. The spectrometer has an interlock system that is designed to extinguish the plasma if either the mains supply fails or the handle on the torch compartment door is opened. *Do not* attempt to bypass the interlock system.

Before opening the torch compartment door, *always* extinguish the plasma by pressing F4 on the keyboard or by clicking the 'Plasma Off' icon on the ICP Expert II software toolbar.

The torch and its surroundings remain hot for up to five minutes after the plasma is extinguished. Touching this area before it has cooled sufficiently may result in burns. Allow the torch and torch compartment to cool before carrying out any work in this area, or wear heat-resistant gloves.

The plasma system has been carefully designed to operate safely and effectively when using torches and related components that conform to Agilent's design criteria. Use of non-approved components in the plasma compartment may render the system inoperative and/or hazardous. It may also invalidate the warranty on the instrument. Use only torches and related components supplied or authorized by Agilent.

Heat, Vapors and Fumes

Heat, ozone, vapors and fumes generated by the plasma can be hazardous, and must be extracted from the instrument by means of an exhaust system. Ensure that an exhaust system of the appropriate type is fitted (see Page 36). The system must be vented to the outside air in accordance with local regulations and never within the building. Regularly check the exhaust system by smoke test to ensure that the exhaust system is functioning correctly. The exhaust fan must always be switched on *before* igniting the plasma.

Compressed Gas Hazards

All compressed gases (other than air) can create a hazard if they leak into the atmosphere. Even small leaks in gas supply systems can be dangerous. Any leak (except that of air) can result in an oxygen-deficient atmosphere, which can cause asphyxiation. The area in which cylinders are stored and the area surrounding the instrument must be adequately ventilated to prevent such gas accumulations.

Gas cylinders must be stored and handled strictly in accordance with local safety codes and regulations. Cylinders must be used and stored only in a vertical position and secured to an immovable structure or a properly constructed cylinder stand. Move cylinders only by securing them to a properly constructed trolley.

Use only approved regulator and hose connectors (refer to the gas supplier's instructions). Keep gas cylinders cool and properly labeled. (All cylinders are fitted with a pressure relief device that will rupture and empty the cylinder if the internal pressure is raised above the safe limit by excessive temperatures.) Ensure that you have the correct cylinder before connecting it to the instrument.

The primary gas to be used with the spectrometer is argon, which is the conductive gas for the plasma. Argon or nitrogen can be used as the polychromator purge gas. Other gases may be required for future options and accessories. Use only 'instrument grade' gases with your spectrometer.

If using cryogenic gases (for example, liquid argon), prevent severe burns by wearing suitable protective clothing and gloves.

Electrical Hazards

The spectrometer system and some accessories contain electrical circuits, devices and components operating at dangerous voltages. Contact with these circuits, devices and components can cause death, serious injury or painful electric shock. Panels or covers which are retained by screws on the spectrometer and accessories may be opened *only* by Agilent-trained, Agilent-qualified or Agilent-approved field service engineers (unless specified otherwise). Consult the manuals or product labels supplied with your personal computer (PC), monitor, printer and water-cooling system to determine which parts are operator-accessible.

Replace blown fuses with ones of the size and rating shown in the text near to the fuse holder.

Other Precautions

Use of the spectrometer system and accessories may involve materials, solvents and solutions which are flammable, corrosive, toxic or otherwise hazardous. Careless, improper or unskilled use of such materials, solvents and solutions can create explosion hazards, fire hazards, toxicity and other hazards that can result in death, serious personal injury or damage to equipment.

Operation of an ICP-OES involves analysis of solutions that have been prepared in or digested with acids, or in some cases, samples that have been prepared in organic solvents.

The acid concentrations in the sample that is measured is variable, depending upon the digestion steps and acid types used. Instrument users should be aware of the hazards associated with use of the acids used for sample preparation and apply all necessary precautions including use of lab coats, safety goggles and other appropriate forms of personal protection. The acid wastes should be disposed of in accordance with local regulatory requirements.

The type, volatility and concentration of the organic solvents used in the sample that is measured is variable, depending upon the selected solvent and the sample preparation involved. Instrument users should be aware of the hazards associated with use of the organic solvents used for sample preparation, and apply all necessary precautions including ensuring adequate ventilation during use, and use of lab coats, safety goggles and other appropriate forms of personal protection. The organic wastes should be disposed of in accordance with local regulatory requirements.

Air flow to the cooling fans of the spectrometer and accessories must be unobstructed. Do not block the ventilation grills on the spectrometer and accessories. Consult the manuals supplied with your PC, monitor, printer and water-cooling system for their specific ventilation requirements.

Great care should be taken when working with glass or quartz parts to prevent breakage and cuts. This is especially important when attaching plastic tubing to glass barbs, or removing and replacing pieces of broken torch or bonnet.

The spectrometer weighs approximately 203 kg (448 lb). To avoid injury to personnel or damage to the instrument or property, always use a forklift or other suitable mechanical lifting device to move the instrument.

Use only Agilent-supplied spares with your instrument.

Warning Symbols

The following is a list of symbols that appear in conjunction with warnings on the spectrometer. The hazard they describe is also shown. The beginning of the warning text is noted by a warning icon:

WARNING

A triangular symbol indicates a warning. The meanings of the symbols that may appear alongside warnings in the documentation or on the instrument itself are as follows:

Broken glass

Corrosive liquids

Electrical shock

Extreme cold hazard

Eye hazard

Fire hazard

Heavy weight (danger to feet)

Heavy weight (danger to hands)

Hot surface

Noxious gases

RF radiation

The following symbol may be used on warning labels attached to the instrument. When you see this symbol, refer to the relevant operation or service manual for the correct procedure referred to by that warning label.

The following symbols appear on the instrument for your information.

	Mains power on
	Mains power off
	Fuse
	Single phase alternating current
	Direct current
	When attached to the rear of the instrument, indicates that the product complies with the requirements of one or more EU directives.
	'Out' position of a bi-stable push switch.
	'In' position of a bi-stable push switch.
	Plasma on
	Plasma off
	'On' for part of equipment.
	'Off' for part of equipment.

Color Coding

The various indicator lights appearing on Agilent instruments and associated accessories are color coded to represent the status of the instrument or accessory.

- A green light indicates the instrument is in normal/standby mode.
- An orange light indicates that a potential hazard is present.
- A blue light indicates that operator intervention is required.
- A red light warns of danger or an emergency.

CE Compliance

Your Agilent 700 Series ICP-OES instrument has been designed to comply with the requirements of the Electromagnetic Compatibility (EMC) Directive and the Low Voltage (electrical safety) Directive (commonly referred to as the LVD) of the European Union. Agilent has confirmed that each product complies with the relevant Directives by testing a prototype against the prescribed EN (European Norm) standards.

Proof that a product complies with these directives is indicated by:

- the CE Marking appearing on the rear of the product, and
- the documentation package that accompanies the product containing a copy of the Declaration of Conformity. The Declaration of Conformity is the legal declaration by Agilent that the product complies with the directives listed above, and shows the EN standards to which the product was tested to demonstrate compliance.

After all safety regulations have been met, check the checklist box: *Principal installation area is in compliance with all relevant safety regulations.*

2. Introduction

This publication contains the information required to successfully prepare a site for an Agilent 700 Series Inductively Coupled Plasma Optical Emission Spectrometer system installation.

On completion of the site preparation, fill in the checklist on Page 4, (striking out those entries not applicable), and send this preinstallation checklist to your local Agilent agent or Agilent sales and service office. As soon as it is received, Agilent or its agent will contact you to arrange a convenient time for installation.

References to the Agilent 700 Series ICP-OES are applicable to all models (Agilent 710, 715, 720, 725, 730 and 735 ICP-OES) unless otherwise stated.

References to the Agilent 7X0 Series ICP-OES are applicable to the Agilent 7X0 and Agilent 7X5 ICP-OES instrument models, where X = 1, 2 or 3. For example, reference to the Agilent 710 Series ICP-OES is applicable to both the Agilent 710 and Agilent 715 ICP-OES instrument models.

If you have difficulty in preparing for the installation, and for details of operator training courses, please contact your Agilent sales or field service representative.

Installation Guidelines

Allow a minimum of one day for the installation of the Agilent 700 Series ICP-OES system by an Agilent field service engineer.

The installation will include the following:

- Spectrometer installation
- Water cooler connection
- Instrument software installation and registration
- Accessory installation
- Spectrometer installation performance tests
- Basic customer training
- Maintenance overview

3. Laboratory Environment

Suitability

The instrument is suitable *only* for indoor use and is classified suitable under the following categories (EN 61010-1):

- Installation category II
- Pollution degree 2
- Equipment class I

Table 1. Suitable environmental conditions for the Agilent 700 Series ICP-OES instruments

Condition	Altitude	Temp. (°C)	Humidity (%RH) non-condensing
Non-operating (Transport)	0–3,050 m (0-10,000 ft)	5–45	20–80
Operating within specifications	0–3,050 m (0-10,000 ft)	10–35	8–80

Environmental Conditions

The area selected for the operation of an Agilent 700 Series ICP-OES system *must be free from drafts, corrosive atmospheres and vibration.* Sample preparation areas and materials storage facilities should be located in a separate room.

Temperature Control

The area should be a dust free, low humidity environment. Air-conditioning is strongly recommended for control of the environment. For optimum analytical performance it is recommended that the ambient temperature of the laboratory is between 20 and 25 °C (68 and 77 °F).

The heat generated by the Agilent 700 Series ICP-OES system into the laboratory is about 3,650 watts (joules per second), or 13,140 kilojoules per hour (12,455 BTU per hour).

NOTE Most of the 3,650 watts generated by the system is extracted from the laboratory by the exhaust system.

The water cooler generates approximately 1,000 watts (joules per second), or 3,600 kilojoules per hour (3,412 BTU per hour).

Total load with both the water cooler and Agilent 700 Series ICP-OES in the same room can be up to 4,650 watts or 16,740 kilojoules per hour (15,867 BTU per hour).

☑ After the temperature requirements have been met, check the checklist box: *Lab temperature maintained between 20 and 25 °C.*

Cleanliness

Limit dust levels to less than 36,000,000 particles (0.5 microns or larger) per cubic meter of air. This is equivalent to a very clean office.

☑ After the cleanliness requirements have been met, check the checklist box: *Laboratory is free of excessive particulate matter.*

Instrument Cooling Air Supply

The Agilent 700 Series ICP-OES instrument requires *clean, dry, non-corrosive air for cooling purposes.* This is supplied to the instrument through an air supply vent located at the top, rear of the instrument. The vent is fitted with a dust filter, to filter out particulate matter from the surrounding environment.

The air supply is used to cool the RF generator and the electronics of the instrument. Several of these assemblies contain parts prone to corrosion. The introduction of cooling air contaminated with high levels of acid vapor or other corrosive substances may cause damage to the instrument.

Due to the corrosive nature of some analytical work, it is recommended that in applications demanding high usage of corrosive materials, an external cooling air supply system be provided. It is *strongly recommended* that the cooling air be supplied from an environmentally controlled area that is away from the instrument exhaust and any other area where corrosive materials are stored or used.

The cooling air system with flue, fan, ducting and supply cowl, must provide a minimum positive flow of 6 cubic meters per minute (200 ft^3/min). The ducting should be corrosion resistant and fire-proof.

NOTE If an external cooling air supply system is required, an air inlet duct attachment (part number 0110595300) must be ordered with the instrument.

☑ After the instrument cooling air supply requirements have been met, check the checklist box: *Cooling air system is set up.*

Workbench

The Agilent 700 Series ICP-OES is a precision optical instrument. The workbench must be free from vibration and must be stable and strong enough to support the total weight of the equipment to be placed on top of the workbench. The bench top should be large enough to permit free circulation of air through the main instrument and around each of the accessories.

The information provided in the weights and dimensions table will help make planning easier. Portable or semi-permanent trolleys can be used as workbenches for the spectrometer system, but you must *lock* the wheels. Accessories such as the Sample Preparation System (SPS) Autosampler, personal computer (PC) and printer can be positioned on a trolley. A specially designed SPS trolley is available from Agilent (part number 9910027800).

To avoid damage through spillage of samples being used, the instrument bench top should be covered with a material that is corrosion-resistant and impervious to liquid spillage. Generally, for comfortable working conditions and easy access to the instrument sample introduction system, Agilent recommends that the height of the workbench be approximately 900 mm (36 in) high. Refer to Figure 1.

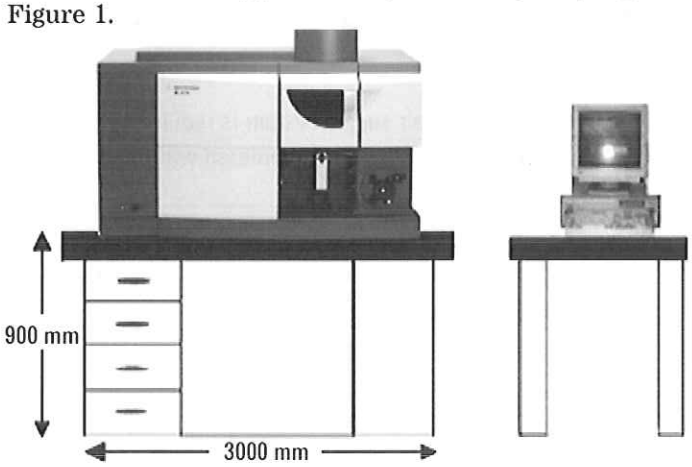


Figure 1. Instrument workbench

Location

The workbench location should permit service access from all sides. A minimum of 400 mm (16 in) free space at the sides of the spectrometer and approximately 750 mm (30 in) at the rear of the instrument is required for maintenance and service access. Leave enough space in front of the instrument to provide easy access to the mains power on/off switch at all times.

The Agilent 700 Series ICP-OES system should not be located close to an access door, window or any other area where drafts may cause unstable temperature conditions.

The following diagrams show the relative dimensions of the main instrument including the space needed for service access. These dimensions should be considered during the preparation for installation of your spectrometer.

The location of the workbench may be determined by the need for an exhaust flue to remove fumes and vapors from the spectrometer sample compartment (see Section 4).

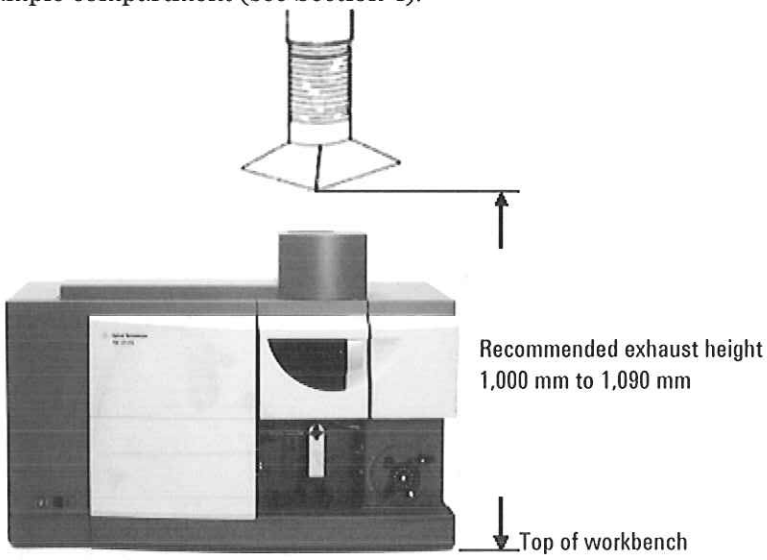


Figure 2. Front view of instrument

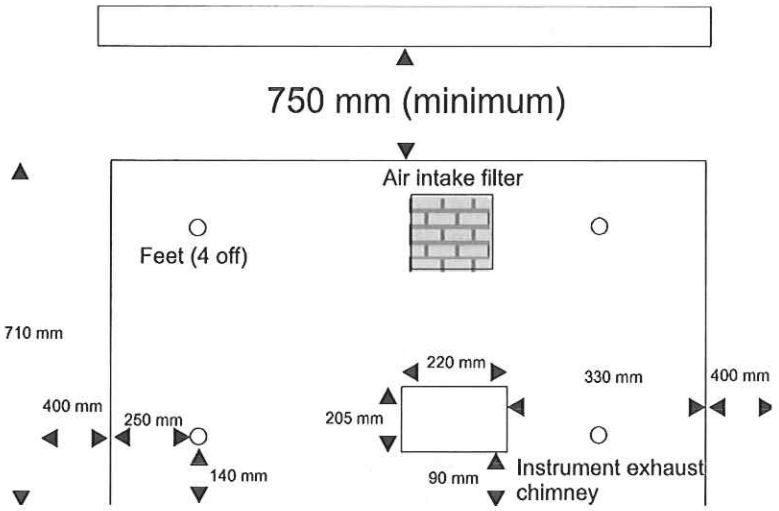


Figure 3. Top view of instrument

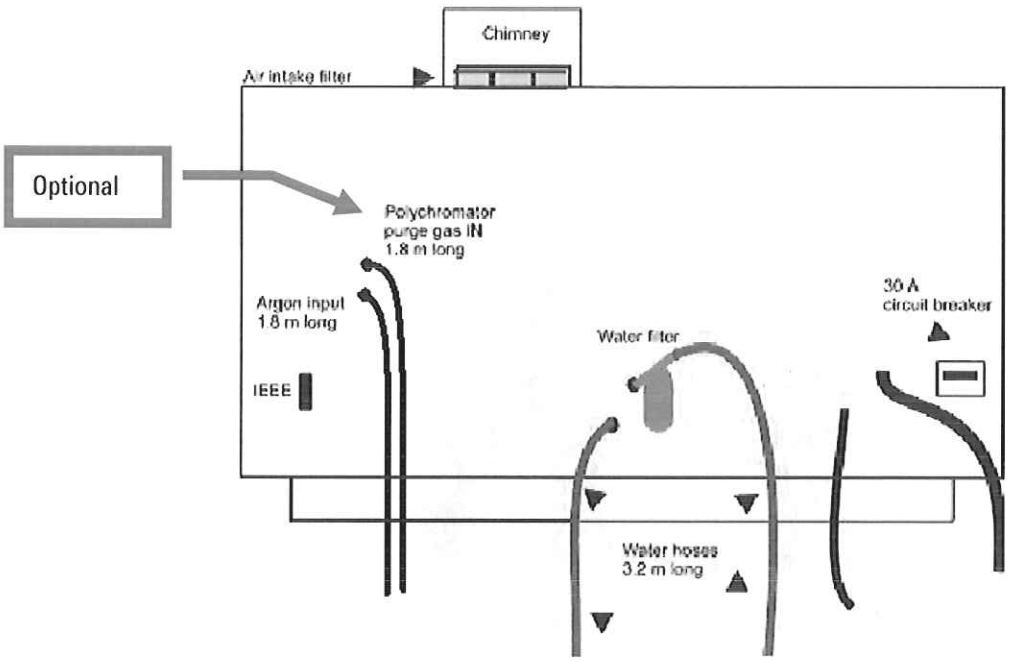


Figure 4. Rear view of instrument

☑ After the workbench vibration and location requirements have been met, check the checklist box: *Workbench requirements met.*

☑ After the bench space requirements have been met, check the checklist box: *Sufficient bench space is available for all components.*

☑ After the bench support requirements have been met, check the checklist box: *Bench can support system weight.* *See Page 29 for Weight and Dimension information.*

PC Requirements

The minimum configuration represents the absolute minimum on which you can run the software. This PC configuration may be out of manufacture, but you may want to use an existing PC. The recommended configuration is that which you would buy new.

Table 2. Agilent 700 Series ICP-OES instruments PC requirements

Minimum	Recommended
Pentium 4 processor, 2.8 GHz or higher	Pentium 4 processor, 3.0 GHz or higher
1 GB of RAM	2 GB of RAM
100 GB hard drive	2 x 200 GB hard drives
16 speed CD-ROM RW or DVD	16 speed CD-ROM RW or DVD
16 bit sound card	16 bit sound card with speakers
Super VGA monitor with high color (16 bit) display, 800 x 600 pixel resolution	Super VGA monitor with high color (16 bit) display, 1024 x 768 pixel resolution
Windows 101 key keyboard	Windows 101 key keyboard
Microsoft or compatible mouse	Microsoft or compatible mouse
RS-232 serial port	RS-232 serial port
One PCI-compatible slot for I/O card (full height)	One PCI-compatible slot for I/O card (full height)
Microsoft Windows XP (Service Pack 3) 32 bit operating system with Internet Explorer version 6	Microsoft Windows XP (Service Pack 3) 32 bit operating system with Internet Explorer version 6

PCs supplied with Letter of Credit orders will be an international brand and will be the 'Recommended' configuration or better.

Higher rated PC components can be substituted for those listed above for example, processor type, amount of memory, screen size and resolution and operating system version.

IEEE 488 Interface

The Agilent 700 Series ICP-OES systems require a PCI-GPIB card to be fitted in the PC. A National Instruments PCI-GPIB card (part number 9910102100) will be included in your instrument order.

The Agilent service engineer will install this PCI-GPIB card in your PC. If you are supplying your own PC, you will need to install this card yourself (refer to the instrument operation manual, supplied with the instrument, for PCI-GPIB card installation instructions).

☑ After the computer requirements have been met, check the checklist box: *Computer requirements met.*

Telediagnostics

In order to make use of Telediagnostics, it is recommended that a separate telephone line is installed for connection to a modem.

A modem and Agilent Telediagnostics kit provides remote diagnostic capabilities. Service engineers can operate all instrument functions remotely and spend less time troubleshooting onsite. By using Telediagnostics, problems can be determined over the phone and parts ordered in advance of the engineer arriving at the site, reducing downtime.

Contact your local Agilent sales and service office to inquire about whether this service is available in your area.

4. Instrument Shipping Information

Generally, Agilent 700 Series ICP-OES instruments are sold as 'Free On Board' to the shipping point, with the transportation from this point at the customer's expense. Due to the size and nature of the spectrometer, it is advisable that a third party is engaged to assist with transportation from the point of unloading to the final placement of the instrument in the laboratory. The Agilent field Sales and Service Offices will be able to assist in the task of recommending a third party that specializes in the transportation of precision scientific instrumentation.

NOTE The Agilent field service engineer cannot start the installation until the instrument is situated on the intended workbench.

In-house Transit Routes

In-house transit routes must be carefully considered. Vertical, horizontal and turning clearances should be calculated from the shipping crate dimensions of the spectrometer, which is the largest unit in any system arrangement.

Figure 5 provides an indication of the minimum turning clearance and minimum door width required for the spectrometer in its shipping crate.

Particular attention should be made to the clearance of any doors in the transit route to the laboratory. The required turning and door clearance may need to take into consideration any lifting device used for transporting the instrument (for example, fork lift, pallet truck or trolley).

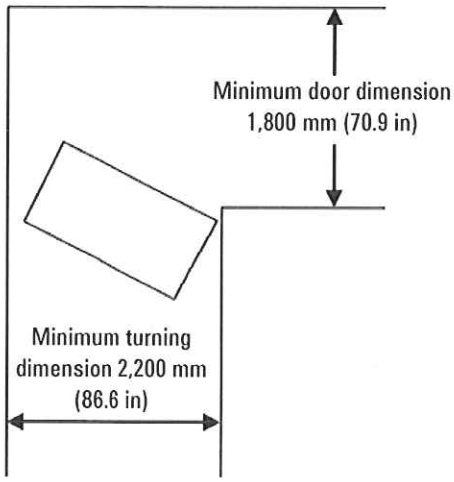


Figure 5. Maximum clearance required for transportation in the shipping crate

☑ After the in-house transit route requirements have been met, check the checklist box: *Entrance to the lab is at least 2,200 cm (86.6 in) wide.*

Insurance after Delivery

As the carrier's liability ceases when the equipment is delivered, Agilent recommends that the instrument owner arranges separate insurance that will cover transportation from the delivery point to the installation site. The delivery point will vary according to the carrier, the shipping method, and in some cases the terms of sale. Some carriers will only deliver to their own distribution center, while others may deliver to the actual installation site.

Weights and Dimensions

Table 3. Weights and dimensions

System unit	Width	Depth	Height	Weight
Agilent 700 Series ICP-OES instrument	1,375 mm 54.5 in	750 mm 29.5 in	990 mm 39 in	203 kg 448 lb
Shipping dimensions	1,660 mm 65.5 in	960 mm 37.8 in	1,420 mm 56 in	285 kg 629 lb
Personal computer (typical)	450 mm 18 in	770 mm 30 in	520 mm 20 in	(N/A)
Printer (typical)	500 mm 18 in	650 mm 30 in	200 mm 20 in	(N/A)
Water cooling system				
Lytron MCS20 G01 and Lytron MCS20 H01 ambient modular cooling systems	439 mm 17.3 in	384 mm 15.1 in	338 mm 13.3 in	16 kg 35 lb
Van der Heijden model 001-RB301 recirculating chiller	430 mm 16.9 in	470 mm 18.5 in	695 mm 27.4 in	54 kg 119 lb
SPS 3	490 mm 19.3 in	285 mm 11.2 in	510 mm 20.1 in	15 kg 33.1 lb
Shipping dimensions	760 mm 29.9 in	500 mm 19.7 in	840 mm 33.1 in	31 kg 68.4 lb
SPS 3 with diluter	572 mm 22.5 in	285 mm 11.2 in	510 mm 20.1 in	18 kg 39.7 lb
Shipping dimensions	760 mm 29.9 in	500 mm 19.7 in	840 mm 33.1 in	34 kg 75.1 lb

Continued overleaf...

System unit	Width	Depth	Height	Weight
SPS trolley	580 mm 23 in	412 mm 17 in	400 mm 16 in	
SVS 1	54 mm 2.1 in	110 mm 4.3 in	177 mm 7.0 in	615 g 1.4 lb
Shipping dimensions	380 mm 15 in	410 mm 16.1 in	265 mm 10.4 in	2 kg 4.4 lb
VGA (including mounting bracket)	385 mm 10 in	340 mm 8 in	195 mm 9 in	6 kg 13.2 lb
Shipping dimensions	490 mm 19.5 in	490 mm 19.5 in	320 mm 12.5 in	10 kg 22 lb
AGM 1 Shipping dimensions	550 mm 22 in	430 mm 17 in	245 mm 9.5 in	
Ultrasonic nebulizer (trolley mounted)	780 mm 31 in	540 mm 21 in	1,150 mm 45 in	

WARNING

Heavy Weight

The Agilent 700 Series ICP-OES weighs approximately 203 kg (448 lb). To avoid injury to personnel or damage to equipment, always use a fork lift or other suitable lifting device when moving the instrument.

Transit Damage

Transit damage can be obvious or concealed, and in either case will only be admitted by the carrier if it is reported as agreed in the terms of their agreement. For any claims against damage in transit, the following general rules apply:

- Before accepting delivery, you should inspect the packages for signs of obvious damage. The nature of any obvious damage must be noted on the carrier's waybill, and then must be countersigned by a representative of the carrier.
- Within the time limits stated in the terms of conditions of carriage, a further inspection must be made for concealed damage. If any damage is found at this stage, the carrier must be notified in writing and all packaging material must be retained for subsequent inspection by a representative of the carrier.
- A copy of any damage report must be forwarded to the Agilent Sales Office dealing with the supply of the equipment.

Agilent 700 Series ICP-OES systems are inherently robust, and the packaging is designed to prevent damage. It must be remembered that the contents form part of a precision measuring system and all packages should be handled accordingly. In transit, sharp jolts and shocks must be avoided and the packages must not be inverted or tilted unnecessarily. Markings on the shipping cartons generally indicate the required orientation of the carton.

Unpacking the Instrument

The following section provides a guide on how to unpack the instrument and place it on the workbench, along with recommendations on equipment required to perform this task. More detailed instructions on unpacking the instrument are supplied with the documentation shipped with the instrument.

NOTE The Agilent field service engineer cannot start the installation until the instrument is finally placed on the intended workbench.

To unpack the instrument:

1. Remove the top wooden cover, which is secured by twelve 1/4 inch bolts.
2. Remove the boxes containing the instrument components.
3. Remove the wood-framed cardboard sides, which are secured by eight 3/18 inch bolts and six 1/4 inch bolts.
4. Remove the plastic wrap and inspect the outside of the instrument for any visible damage.
5. The instrument is held in position by two lengths of square, hollow tubing inserted through hat section brackets welded to the base of the instrument. These square, hollow tubes are secured to the pallet by four 1/2 inch bolts at the base of the shipping crate.
6. To release the instrument from the pallet, remove the four 1/2 inch bolts and plates, and slide the two square hollow tubes out from the hat sections on the instrument.
7. Using a fork lift at the front or rear of the instrument (slide the forks in between the instrument and the top of the shipping pallet), lift the instrument and place it onto the intended workbench.

WARNING **Heavy Weight**

The Agilent 700 Series ICP-OES weighs approximately 203 kg (448 lb). To avoid injury to personnel or damage to equipment, always use a fork lift or other suitable lifting device when moving the instrument.

8 Once the instrument is in position on the workbench and the pre-installation checklist is complete, contact your Agilent office to arrange installation.

WARNING

Electrical Shock Hazard
To prevent death or personnel injury from accidental contact with high voltages within the instrument, do not remove any of the instrument covers. Do not connect the instrument to the mains supply.

☑ After the instrument is unpacked and on the benchtop, check the checklist box: *Instrument unpacked and placed on the workbench.*

5. Laboratory Facilities

Exhaust System

The plasma operates at a temperature of approximately 10,000 °C, (18,000 °F) with up to 1,800 watts of RF energy (6,480 kilojoules per hour). Sample compartment exhaust fumes can be noxious or corrosive.

The Agilent 700 Series ICP-OES must be located under a flue that is vented by an exhaust fan and ducted to an external vent. The exhaust system with flue, ducting and external vent must provide a minimum flow of 6 cubic meters per minute (200 ft^3/min).

The exhaust system installation must comply with any rules and/or regulations that may be imposed by the local authorities responsible for control of facilities and fixtures in the work place.

The exhaust fan should be located at least 2 meters (6 feet and 6 inches) away from the top of the instrument chimney. The fan control switch and running indicator lamp should be located in a position where the instrument operator can view the indicator and access the control switch.

Ducting must be corrosion-resistant, fire-proof and should be kept clear of fire alarms, sprinkler heads and other heat sensitive devices.

The external vent must be fitted with a back draft damper and the outlet location must be clear of doors, windows and heater or air-conditioning units.

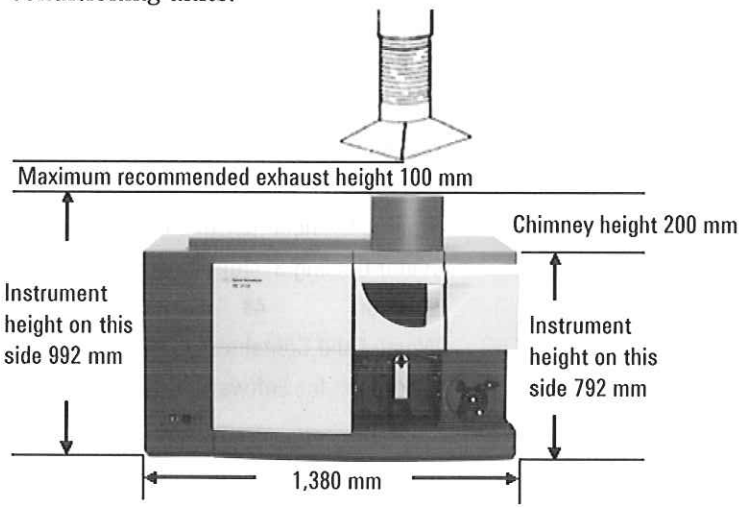


Figure 6. Spectrometer and flue position

Agilent Exhaust System

The component parts required for an exhaust system may be purchased from Agilent. The parts may be ordered individually or in kit form. To allow for personal preferences, control gear, switch and pilot light assemblies are not supplied by Agilent.

Table 4. Agilent Exhaust kit part numbers

Exhaust kit	Part number
Exhaust kit for 240 V, 50 Hz supply	9910056600
Exhaust kit for 115 V, 60 Hz supply	9910056500

NOTE Mounting hardware for the flue and fan is not included with the Agilent-supplied Exhaust Kit.

Each Agilent exhaust kit contains the following items, which *must* be installed by local fitters and not the Agilent service engineer.

Table 5. Exhaust kit components (refer to Figure 7)

Item	Remarks	Part number	Quantity
1	Exhaust fan (for 240 V, 50 Hz supply only)	1810000100	1
	Exhaust fan (for 115 V, 60 Hz supply only)	1810000200	1
2	Flue without mounting brackets	5510000300	1
3	Flexible ducting 1 meter length, aluminum	0410000400	3
4	Coupling for joints in ducting	1610000200	2
5	Ducting clamp two required per coupling	0810000300	6

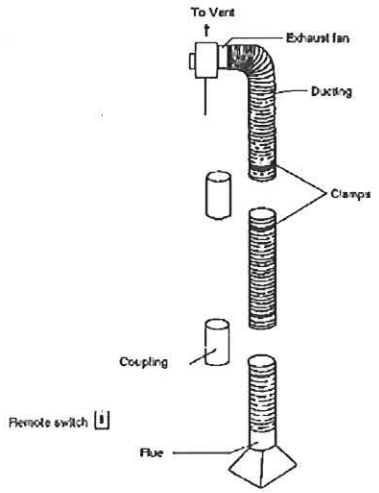


Figure 7. Agilent exhaust kit components

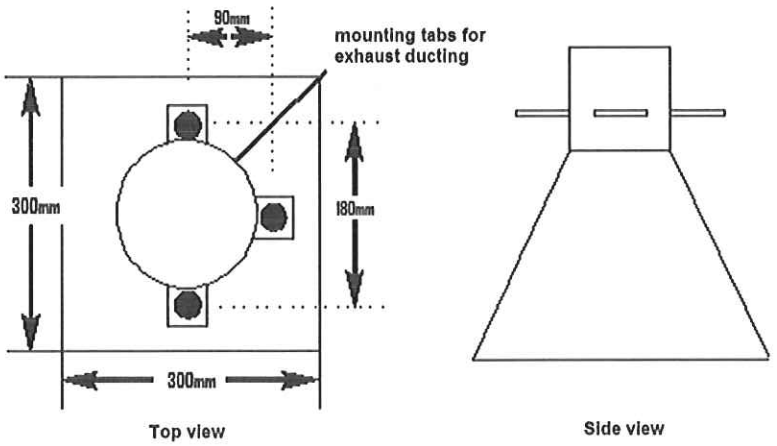


Figure 8. Exhaust ducting details

Agilent Exhaust Fan Electrical Information

Table 6. Exhaust fan motor specifications

Part number	1810000100	1810000200
Voltage	240 volts single phase	115 volts single phase
Current	0.45 A	0.7 A
Frequency	50 Hz	60 Hz
Power input	74 W	51 W
Direction of rotation	Anti-clockwise (shaft end)	
Nominal RPM	≅ 1600	

Installation instructions for the exhaust fan are included with the Agilent-supplied Exhaust Kit.. Figure 9 details exhaust fan wiring information for the 115 V 60 Hz fan *only*. The 115 V exhaust fan supplied by Agilent must be configured to operate in permanent split phase mode as shown.

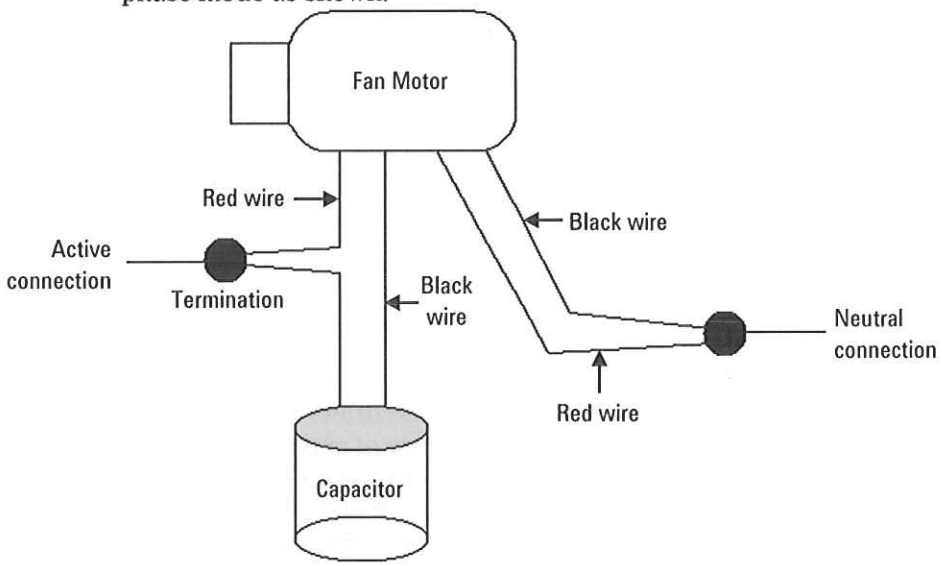


Figure 9. Electrical wiring information for 115 V AC 60 Hz fan only

☑ After the exhaust requirements have been met, check the checklist box: *Exhaust system is suitable.*

Electrical Power Supplies

The installation of electrical power supplies must comply with the rules and/or regulations imposed by the local authorities responsible for the use of electrical energy in the workplace.

All power supplies for the Agilent 700 Series ICP-OES, its accessories and water cooler should be single phase, AC, 3 wire systems (active, neutral, ground; or two active and ground). Each connection should be terminated at an appropriate receptacle within reach of each assembly's power cable. Use of power boards or extension cables is *not* recommended.

It is recommended that separate mains circuits, (individually protected by fuses or circuit breakers) are used for each component in the system such as the water cooler, autosampler and printer.

Avoid using power supplies from a source that may be subject to electrical interference from other services (such as large electric motors, elevators, welders and air conditioning units).

Agilent 700 Series ICP-OES are supplied with a 2 meter long (6 feet and 6 inches), mains supply cable. The power cable is hardwired to the rear of the instrument. The cable is rated to 600 V AC at 30 amps and terminated as indicated in Table 8 on Page 42.

Local regulations in several European countries do not permit the use of a breakable wall-mounted power supply connection for high current single phase mains supplies. In these areas, the mains power supply to the Agilent 700 Series ICP-OES should be hardwired to the wall.

The Agilent 700 Series ICP-OES draws a maximum of 28 amps RMS at 187 volts with a power factor of approximately 0.70. In areas where 208 to 240 V AC single phase power supplies are not available at the required rating, two active phases from a two or three phase system may be used with a 380/415 volt phase-to-phase, to 220 volt single phase step down transformer.

Electrical Requirements

Table 7. System electrical specifications

System unit	Required supply voltage	Nominal rating
Spectrometer	208 V AC ±10% 220 V AC ±10% Equivalent to 230 V AC +6%, -14% 240 V AC ±10% Equivalent to 230 V AC +14%, -6% Frequency 50/60 Hz ±1 Hz	5.1 kVA
Water cooler (typical)	220–240 V AC, 50 Hz 115 V AC, 60 Hz Voltage ±10%, Frequency ±1 Hz	1450 VA 1645 VA
SPS 3 Sample Preparation System	96–264 V AC, 50–60 ±1 Hz	~220 VA
VGA 77	100 V AC, ±10% 120 V AC, ±10% 220 V AC, ±10% Equivalent to 230 V AC +6%, -14% 240 V AC, ±10% Equivalent to 230 V AC +14%, -6% Frequency 49–61 Hz	24 VA
SVS 1	100–240 V AC, 50–60 Hz	1.5 A
Personal computer (typical)	115, 120, 220, 240 V AC, 50/60 Hz	300 VA
Printer (typical)	115, 120, 220, 240 V AC, 50/60 Hz	85 VA

Spectrometer Power Connections

Table 8. Spectrometer power connections

Power supply phase	Single
Cable rating	600 V AC, 30 A

	Plug supplied	Required wall socket
Australia	250 V 32 A Clipsal 56P332	250 V 32 A Clipsal 56C332
USA	Nema L6-30P Hubbell # 2621P	Nema L6-30R Hubbell # 2620R
Europe	Customer supplied (no plug fitted)	Match selected plug

IEEE 488

NOTE Basic insulation is provided for single fault protection on the IEEE connector.

☑ After the electrical requirements have been met, check the checklist box: *Specified electrical supply and power outlets installed.*

Fuses

1FS1 and 1FS2	T6.3 AH 250 V, IEC 127 sheet 5, 5 x 20 mm
1CB1	Circuit breaker 30 A Fast trip

NOTE For safety reasons, any other internal fuse or circuit breaker is not operator accessible, and should only be replaced by Agilent-authorized personnel.

Fuse information on the rear of the instrument is the most up-to-date.

Gas Supplies

The installation of compressed or liquid gas supplies must comply with the rules and/or regulations imposed by the local authorities responsible for such use in the workplace.

The responsible body must carry out leakage tests necessary for safety on gas connections.

Liquid or gaseous argon and nitrogen may be used with the Agilent 700 Series ICP-OES system. Agilent recommends the use of liquid gases, which are usually higher purity, more convenient and cheaper per unit volume.

NOTE Either argon or nitrogen gas may be used as an optics purge gas on the Agilent 700 Series ICP-OES systems.

The main gas supply requirement is argon for supply to the plasma, nebulizer and optics interface purge. Gas is also required to purge the polychromator assembly, and this may be either argon or nitrogen. A separate gas line connects internally to the argon supply unless the optional nitrogen purge kit is fitted (either factory or field-fitted).

NOTE The nitrogen purge kit is fitted as standard on the Agilent 730 Series ICP-OES systems.

Table 9. Argon and nitrogen gas specifications

	Argon	Nitrogen (if nitrogen is used to purge the polychromator)
Purity	99.996%	99.996%
Oxygen	<5 ppm	<5 ppm
Nitrogen (argon only)	<20 ppm	-
Water vapor	<4 ppm	<4 ppm
Permissible pressure range	400–600 kPa (57–88 psi)	
Recommended pressure	550 kPa (80 psi) regulated	

Table 10. Typical flow rates for the Agilent 700 Series ICP-OES instruments

	Argon (with argon purge gas)	Nitrogen (as purge gas)
Standby mode	0.75 L/min	Nitrogen flow 0.45 L/min
Operational range (plasma on)	9–32.8 L/min	Argon flow 8.3–29.1 L/min Nitrogen flow 0.45–2.1 L/min
Typical flows		
Measuring wavelengths > 200 nm (poly boost off)	21 L/min	Argon flow 20.25 L/min Nitrogen flow 0.45 L/min
Measuring wavelengths < 200 nm (poly boost on)	24 L/min	Argon flow 20.25 L/min Nitrogen flow 2.1 L/min

The Agilent 700 Series ICP-OES is fitted with a PTFE gas supply hose, 1.8 meters (6 feet) in length fitted with 1/4 inch Swagelok hardware. Gas supply adapters are included with each instrument to connect the instrument to regulated gas supplies.

Storage Cylinder Instructions

Cylinders containing gas under pressure should be firmly secured to a rigid structure, and the storage area must be adequately ventilated.

Never locate gas cylinders near a source of ignition, or in a position that is subject to direct heat. Gas storage cylinders often incorporate a pressure release device, which will discharge the gas at a predetermined temperature, usually around 52 °C (125 °F).

If gases are to be plumbed from a remote storage area to the instrument site, ensure that the local outlets are fitted with stop valves, pressure gauges and suitable regulators, which are easily accessible to the instrument operator. The gas outlets must be provided within 1.5 meters (5 feet) of the instrument.

Cryogenic Liquids

Cryogenic liquid gases are stored under pressure at very low temperatures in Portable Liquid Cylinders (PLC).

WARNING

Extreme Cold

Contact with the super-cold liquid, gas or pipe surfaces can cause severe skin damage. The Portable Liquid Cylinders should be located in a shielded position, and all piping should be routed or covered to prevent skin contact.

For high gas flow rates and/or low ambient temperatures, it may be necessary to obtain sufficient gas pressure by passing the liquid through an external evaporator rather than use the internal pressure building facility of the PLCs.

Liquid argon and liquid nitrogen may **not** be stored for extended periods and often have special storage requirements. Contact your local authorities and cryogenic gas supplier for more detailed information on storage requirements and boil-off rates for local types of PLCs.

☑ After the gas requirements have been met, check the checklist box: *Gas supply (at specified purity), regulator, and gas lines are installed for argon and optional nitrogen.*

Water Cooling System

Agilent 700 Series ICP-OES instruments require a source of cooling water. The water cooling system needs to remove up to 200 watts for radial instruments and 950 watts for axial instruments. The cooling water is required for the load coil and camera Peltier assembly. Axial instruments also require cooling capacity for the sample cone interface. The instrument incorporates an in-line particulate filter and water flow sensor on the water supply line.

Provided that the flow rate can be maintained above 1.1 L/min, and maximum supply pressure is below 310 kPa (45 psi), the cooling water supply may be taken from an in-house domestic water system, if local regulations permit.

An alternative is to install a recirculating water cooler system. The system should provide cover for the reservoir to prevent evaporation and stop contamination by dust or other impurities. Algaecide should be used to prevent algae growth that may restrict the flow of cooling water through the system.

A recirculating water cooling system has the advantage of reducing the volume of water that will be required over the life of the instrument's operation. Because of the limited size of the water cooler's reservoir, in the case of accidental damage the amount of water damage that can occur will also be limited.

Specified models of the Lytron or Van der Heijden water coolers can be used and will ensure the continued delivery of temperature controlled coolant, at the correct pressure, with a minimum of long-term maintenance or operational expense.

The Agilent field service engineer will connect the Agilent 700 Series ICP-OES instrument to your water cooling system. Connection of the water cooling system to the spectrometer, installation and adjustment of the internal pressure regulator and cut-out valve (where fitted) are included as part of the system installation. Installation of the required power connections and unpacking of the cooler/recirculator must be performed prior to installation of the instrument.

NOTE The operation manual and mounting and assembly hardware for the cooling system is included in the water cooler packaging. Locate all of these articles before the pack is discarded.

Table 11. Agilent 700 Series ICP-OES cooling requirements

Cooling capacity	Axial system: 1 kW Radial system: 200 W
Flow rate	1.1 L/min (0.3 gpm) minimum
Recommended inlet temperature	20 °C (68 °F) (Maximum for Agilent 720/730 Series ICP-OES: 30 °C (86 °F) (Maximum for Agilent 710 Series ICP-OES: 45 °C (113 °F)
Minimum inlet pressure	55 kPa (8.0 psi)
Maximum inlet pressure	310 kPa (45 psi)

NOTE Pressure regulation is recommended for water cooling systems that may exceed the maximum permissible pressure of 310 kPa (45 psi) or may be subject to pressure fluctuations.

The instrument is equipped with a water flow sensor, which will stop operation of the plasma and camera Peltier assembly if the cooling water flow through the instrument drops below 1.1 L/min (0.3 gpm).

Recommended water cooling systems and pressure regulators are available from:

Table 12. Water cooler suppliers

Lytron	Van der Heijden
Main office: Lytron Inc. 55 Dragon Court Woburn, MA 01801 USA Phone +1 781-933-7300 Fax +1 781-935-4529 Website: www.lytron.com E-mail: info@lytron.com	Main office: Van der Heijden-Labortechnik GmbH P.O. Box 1153 D-32690 Dörentrup Brüderstraße 10 D-32694 Dörentrup Germany Phone: +49 52 65 - 9 45 52-0 Fax: +49 52 65 – 945 51-10 Website: www.van-der-heijden.de E-mail: info@van-der-heijden.de

CAUTION *Always* ensure the water cooling system is on before igniting the plasma.

Location

Many water coolers are designed to be located and operated indoors. Consult the water cooler's literature for more information before installing.

The coolant supply and return hoses of the Agilent 700 Series ICP-OES are 3.0 meters long (10 feet). The inner diameter of the return hose is 7 mm (1/4 inch). The inner diameter of the supply hose is 9.5 mm (3/8 inch). The supply and return connection to the water cooling source will require suitable metal barbs that accommodate these diameter hoses. For most countries, the appropriate barbs for connecting the instrument to the water coolers are included with the instrument in kit form (part number 9910088600).

Part numbers for ordering additional hose by the meter and clamps:

Table 14. Agilent cooling system component part numbers

Item	Part number
1/4 inch hose (per meter)	3710029700
3/8 inch hose (per meter)	3710029800
Hose clamp (1/4 inch)	0810120900
Hose clamp (3/8 inch)	0810096700

☑ After the water cooling requirements have been met, check the checklist box: *Water cooling/circulation system and power connections are set up.*

Waste Fluid Container

Operation of the Agilent 700 Series ICP-OES system requires the use of a drain vessel for the disposal of excess fluids and vapors from the spraychamber. Suitable tubing is supplied with the spectrometer for use with inorganic solvents. When using organic solvents, different drain tubing that is suitable for the solvent in use will be required.

A chemically inert container, not glass or of a narrow necked style, to hold minimum of two liters (four pints) of waste must be provided by the instrument user. It should be located underneath the sample compartment (or to the right side of the spectrometer), where it is protected by the bench and in full view of the operator.

☑ After the waste fluid container requirements have been met, check the checklist box: *Waste container appropriate for the chemical waste is prepared.*

Guidelines for Software Installation

Agilent recommends that you purchase a PC as part of the Agilent 700 Series ICP-OES package. The PC included in the package will come with the appropriate operating system as loaded by the PC supplier.

For instructions on installing the Microsoft Windows operating system, please refer to the appropriate manuals supplied with the software. It is the responsibility of the customer to ensure that the operating system software has been installed and is functional if the customer is supplying the PC or the operating system.

NOTE Agilent will not assume responsibility for loss of data.

The Agilent service engineer will connect the PC to the spectrometer and any factory-approved accessories purchased at installation. Initial instrument software installation is also included as part of the system installation. For information on installing the Agilent 700 Series ICP-OES system software, consult the ICP Expert II software installation instructions (part number 8510236400) or the ICP Expert II CFR software installation instructions (part number 8510233500) that is supplied with the instrument software.

6. Accessories and Options

Organic Solvents or Hydrofluoric Acid

If organic solvents or hydrofluoric acid are intended to be used with the instrument, then special tubing and fittings are required.

Please refer to the Agilent Technologies website for details and part number information.

NOTE The special fittings supplied for use with organic solvents and hydrofluoric acid may not be suitable for acidic or alkaline solvents. The standard (originally supplied) components should be retained for use in these applications.

Auxiliary Gas Module

The Auxiliary Gas Module (AGM 1) is an accessory used to introduce a small amount of oxygen into the plasma of an Agilent 700 Series ICP-OES.

The oxygen facilitates the analysis of volatile organics by ICP techniques by reducing carbon buildup and background signal resulting in lower detection limits when analyzing volatile organic solutions.

The AGM 1 is generally used in conjunction with the cooled spraychamber. This allows you to directly analyze, without dilution, organic solutions with a high vapor pressure at room temperature such as gasoline and naphtha. Cooling of the sample prevents high vapor pressures being generated in the spraychamber, which can cause back pressure in the chamber, destabilizing the plasma and suppressing the analytical signal.

The cooled spraychamber requires a cooler capable of cooling the spraychamber to approximately -10 °C. This cooler is *not* included with the AGM 1, cooled spraychamber or organics kits.

The AGM 1 unit features an on/off switch, a flow control knob and a flow indicator.

Gas Requirements

All gas supply installations must comply with rules and/or regulations that are imposed by the local authorities responsible for the use of compressed gas in the workplace.

Table 15. AGM 1 gas supply requirements

Permissible pressure range	300–700 kPa (43–101 psi)
Recommended pressure	300 kPa (43 psi)
Required flow rates	Up to 0.6 L/min

Cooled Spraychamber Organics Kit

The cooled spraychamber comes in a kit with tubing and attachments.

You will need to provide a cooler capable of cooling to approximately -10 °C and tubing to connect the cooler to the spraychamber.

The Organics kit will include the following components:

- Peristaltic pump tubing organics Black (sample)
- Peristaltic pump tubing organics Grey (drain)
- Transfer tubing for use with gasoline
- Nebulizer holder*
- O-ring (for nebulizer)*
- O-ring kit (for nebulizer holder)*
- Spraychamber tubing to drain
- Drain tubing
- Cooled spraychamber
- Mounting bracket
- Instruction sheet

* These items are assembled as one unit.

Sample Preparation System (SPS 3)

The Sample Preparation System (SPS) is compatible with a wide range of commercially available low-cost autoclavable sample racks.

Sample contamination from airborne particles is eliminated and corrosive or toxic fumes are removed during sampling with the optional environmental enclosure.

Environmental Conditions

The SPS accessory is suitable *only* for indoor use. The site should be selected to avoid dusty or corrosive atmospheres.

NOTE Extra maintenance may be required on the SPS if it is operated in excessively dusty or corrosive conditions.

An Agilent-supplied trolley is available for the SPS (part number 9910072800). A drain vessel must also be accommodated.

Vapor Generation Accessory Recommended Gases

The Vapor Generation Accessory (VGA) is fitted with 6 mm (1/4 inch) internal diameter flexible hose for connection to a standard barbed tail connector, which must be supplied by the customer.

CAUTION The gas supply for the VGA must be a separate regulated line, to prevent exceeding the maximum inlet pressure to the VGA.

NOTE The VGA allows a 45 mL/min flow of argon to pass through it even when it is switched off. It is recommended that the argon gas line is fitted with a stop valve to shut off the gas supply to the VGA.

Table 15. VGA gas supply requirements

Permissible pressure range	300–400 kPa (42–57 psi)
Recommended pressure	325 kPa (46 psi)
Required flow rates	Up to 100 mL/min

Switching Valve System (SVS 1) Accessory

The SVS 1 includes a 4-port switching valve that reduces analysis time by way of a more efficient sample introduction and rinsing system. It can be used with the following autosamplers:

- Agilent SPS 3
- CETAC ASX-510/510HS/520/520HS
  (Includes EXR-8, extended rack option)

The SVS 1 Accessory is supported with the ICP Productivity Package software, provided as standard with Agilent 730 Series ICP-OES instruments. The software is optional for Agilent 720 Series ICP-OES instruments.

Rev. 07/12

State of West Virginia

VENDOR PREFERENCE CERTIFICATE

Certification and application* is hereby made for Preference in accordance with ***West Virginia Code***, §5A-3-37. (Does not apply to construction contracts). ***West Virginia Code***, §5A-3-37, provides an opportunity for qualifying vendors to request (at the time of bid) preference for their residency status. Such preference is an evaluation method only and will be applied only to the cost bid in accordance with the ***West Virginia Code***. This certificate for application is to be used to request such preference. The Purchasing Division will make the determination of the Resident Vendor Preference, if applicable.

1. **Application is made for 2.5% resident vendor preference for the reason checked:**
____ Bidder is an individual resident vendor and has resided continuously in West Virginia for four (4) years immediately preceding the date of this certification; **or,**
____ Bidder is a partnership, association or corporation resident vendor and has maintained its headquarters or principal place of business continuously in West Virginia for four (4) years immediately preceding the date of this certification; or 80% of the ownership interest of Bidder is held by another individual, partnership, association or corporation resident vendor who has maintained its headquarters or principal place of business continuously in West Virginia for four (4) years immediately preceding the date of this certification; **or,**
____ Bidder is a nonresident vendor which has an affiliate or subsidiary which employs a minimum of one hundred state residents and which has maintained its headquarters or principal place of business within West Virginia continuously for the four (4) years immediately preceding the date of this certification; **or,**

2. **Application is made for 2.5% resident vendor preference for the reason checked:**
____ Bidder is a resident vendor who certifies that, during the life of the contract, on average at least 75% of the employees working on the project being bid are residents of West Virginia who have resided in the state continuously for the two years immediately preceding submission of this bid; **or,**

3. **Application is made for 2.5% resident vendor preference for the reason checked:**
____ Bidder is a nonresident vendor employing a minimum of one hundred state residents or is a nonresident vendor with an affiliate or subsidiary which maintains its headquarters or principal place of business within West Virginia employing a minimum of one hundred state residents who certifies that, during the life of the contract, on average at least 75% of the employees or Bidder's affiliate's or subsidiary's employees are residents of West Virginia who have resided in the state continuously for the two years immediately preceding submission of this bid; **or,**

4. **Application is made for 5% resident vendor preference for the reason checked:**
____ Bidder meets either the requirement of both subdivisions (1) and (2) or subdivision (1) and (3) as stated above; **or,**

5. **Application is made for 3.5% resident vendor preference who is a veteran for the reason checked:**
____ Bidder is an individual resident vendor who is a veteran of the United States armed forces, the reserves or the National Guard and has resided in West Virginia continuously for the four years immediately preceding the date on which the bid is submitted; **or,**

6. **Application is made for 3.5% resident vendor preference who is a veteran for the reason checked:**
____ Bidder is a resident vendor who is a veteran of the United States armed forces, the reserves or the National Guard, if, for purposes of producing or distributing the commodities or completing the project which is the subject of the vendor's bid and continuously over the entire term of the project, on average at least seventy-five percent of the vendor's employees are residents of West Virginia who have resided in the state continuously for the two immediately preceding years.

7. **Application is made for preference as a non-resident small, women- and minority-owned business, in accordance with *West Virginia Code* §5A-3-59 and *West Virginia Code of State Rules*.**
____ Bidder has been or expects to be approved prior to contract award by the Purchasing Division as a certified small, women- and minority-owned business.

Bidder understands if the Secretary of Revenue determines that a Bidder receiving preference has failed to continue to meet the requirements for such preference, the Secretary may order the Director of Purchasing to: (a) reject the bid; or (b) assess a penalty against such Bidder in an amount not to exceed 5% of the bid amount and that such penalty will be paid to the contracting agency or deducted from any unpaid balance on the contract or purchase order.

By submission of this certificate, Bidder agrees to disclose any reasonably requested information to the Purchasing Division and authorizes the Department of Revenue to disclose to the Director of Purchasing appropriate information verifying that Bidder has paid the required business taxes, provided that such information does not contain the amounts of taxes paid nor any other information deemed by the Tax Commissioner to be confidential.

Under penalty of law for false swearing (West Virginia Code, §61-5-3), Bidder hereby certifies that this certificate is true and accurate in all respects; and that if a contract is issued to Bidder and if anything contained within this certificate changes during the term of the contract, Bidder will notify the Purchasing Division in writing immediately.

Bidder: _____ **Signed:** _____

Date: _____ **Title:** _____

Does not apply. N/A

RFQ No. 7713014

STATE OF WEST VIRGINIA
Purchasing Division

PURCHASING AFFIDAVIT

MANDATE: Under W. Va. Code §5A-3-10a, no contract or renewal of any contract may be awarded by the state or any of its political subdivisions to any vendor or prospective vendor when the vendor or prospective vendor or a related party to the vendor or prospective vendor is a debtor and: (1) the debt owed is an amount greater than one thousand dollars in the aggregate; or (2) the debtor is in employer default.

EXCEPTION: The prohibition listed above does not apply where a vendor has contested any tax administered pursuant to chapter eleven of the W. Va. Code, workers' compensation premium, permit fee or environmental fee or assessment and the matter has not become final or where the vendor has entered into a payment plan or agreement and the vendor is not in default of any of the provisions of such plan or agreement.

DEFINITIONS:

"Debt" means any assessment, premium, penalty, fine, tax or other amount of money owed to the state or any of its political subdivisions because of a judgment, fine, permit violation, license assessment, defaulted workers' compensation premium, penalty or other assessment presently delinquent or due and required to be paid to the state or any of its political subdivisions, including any interest or additional penalties accrued thereon.

"Employer default" means having an outstanding balance or liability to the old fund or to the uninsured employers' fund or being in policy default, as defined in W. Va. Code § 23-2c-2, failure to maintain mandatory workers' compensation coverage, or failure to fully meet its obligations as a workers' compensation self-insured employer. An employer is not in employer default if it has entered into a repayment agreement with the Insurance Commissioner and remains in compliance with the obligations under the repayment agreement.

"Related party" means a party, whether an individual, corporation, partnership, association, limited liability company or any other form or business association or other entity whatsoever, related to any vendor by blood, marriage, ownership or contract through which the party has a relationship of ownership or other interest with the vendor so that the party will actually or by effect receive or control a portion of the benefit, profit or other consideration from performance of a vendor contract with the party receiving an amount that meets or exceed five percent of the total contract amount.

AFFIRMATION: By signing this form, the vendor's authorized signer affirms and acknowledges under penalty of law for false swearing (*W. Va. Code* §61-5-3) that neither vendor nor any related party owe a debt as defined above and that neither vendor nor any related party are in employer default as defined above, unless the debt or employer default is permitted under the exception above.

WITNESS THE FOLLOWING SIGNATURE:

Vendor's Name: Agilent Technologies, Inc.

Authorized Signature: * _____ Date: 2/15/2013

State of Delaware

County of New Castle, to-wit:

Taken, subscribed, and sworn to before me this 15 day of February, 20 13.

My Commission expires July 6, 20 16.

AFFIX SEAL HERE

NOTARY PUBLIC Shirley B. Lamkin

SHIRLEY B. LAMKIN
NOTARY PUBLIC
STATE OF DELAWARE
MY COMMISSION EXPIRES ON
July 06, 2016

NOTE:
Vendor and Notary's date must be the same.
Notary required to AFFIX SEAL on Purchasing Affidavit.