



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

# Request for Quotation

RFQ NUMBER  
**GSD116661**

PAGE  
**1**

ADDRESS CORRESPONDENCE TO ATTENTION OF  
**KRISTA FERRELL  
 304-558-2596**

*Patrick H. Gill*  
*GE Betz*  
*4630 Somerton Rd.*  
*Trevose, PA 19053*

DEPARTMENT OF ADMINISTRATION  
 VARIOUS LOCALES AS INDICATED  
 BY ORDER

DATE PRINTED	TERMS OF SALE	SHIP VIA	F.O.B.	FREIGHT TERMS
12/29/2010				

BID OPENING DATE: **01/27/2011** BID OPENING TIME **01:30PM**

LINE	QUANTITY	UOP	CAT NO.	ITEM NUMBER	UNIT PRICE	AMOUNT
0001	1	MN		962-23		
<p><b>MONTHLY WATER TREATMENT SERVICES</b></p> <p><b>REQUEST FOR QUOTATION (RFQ) OPEN END CONTRACT</b></p> <p>THE WEST VIRGINIA STATE PURCHASING DIVISION FOR THE AGENCY, THE WEST VIRGINIA DIVISION OF GENERAL SERVICES, IS SOLICITING BIDS TO PROVIDE THE AGENCY WITH AN OPEN END CONTRACT FOR WATER TREATMENT SERVICES FOR VARIOUS DEPARTMENT OF ADMINISTRATION OWNED AND OPERATED BUILDINGS PER THE ATTACHED SPECIFICATIONS.</p> <p>TECHNICAL QUESTIONS CONCERNING THIS SOLICITATION MUST BE SUBMITTED IN WRITING TO KRISTA FERRELL IN THE WEST VIRGINIA STATE PURCHASING DIVISION VIA MAIL AT THE ADDRESS SHOWN IN THE BODY OF THIS RFQ, VIA FAX AT 304-558-4115, OR VIA EMAIL AT KRISTA.S.FERRELL@WV.GOV. DEADLINE FOR ALL TECHNICAL QUESTIONS IS 01/12/2011 AT THE CLOSE OF BUSINESS. ANY TECHNICAL QUESTIONS RECEIVED SHALL BE ANSWERED BY FORMAL ADDENDUM TO BE ISSUED BY THE PURCHASING DIVISION AFTER THE DEADLINE HAS LAPSED.</p> <p>SITE VISITS MAY BE ARRANGED BY CONTACTING DAVID PARSONS, OPERATIONS AND MAINTENANCE MANAGER AT 304-558-0689 OR VIA EMAIL AT DAVID.K.PARSONS@WV.GOV.</p> <p>ANY VERBAL COMMUNICATION BETWEEN THE VENDOR AND ANY</p>						

**RECEIVED**

2011 JAN 27 A 9:36

PURCHASING DIVISION  
STATE OF WV

SEE REVERSE SIDE FOR TERMS AND CONDITIONS

SIGNATURE: *Patrick H. Gill* TELEPHONE: 215-355-3300 DATE: 1-26-2011

TITLE: Commercial Operations FEIN: 23-1503731 ADDRESS CHANGES TO BE NOTED ABOVE

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



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

# Request for Quotation

RFQ NUMBER  
**GSD116661**

PAGE  
**2**

ADDRESS CORRESPONDENCE TO ATTENTION OF  
**KRISTA FERRELL  
 304-558-2596**

RFQ COPY  
 TYPE NAME/ADDRESS HERE

DEPARTMENT OF ADMINISTRATION  
 VARIOUS LOCALES AS INDICATED  
 BY ORDER

DATE PRINTED	TERMS OF SALE	SHIP VIA	FOB	FREIGHT TERMS
12/29/2010				

BID OPENING DATE: **01/27/2011** BID OPENING TIME **01:30PM**

LINE	QUANTITY	UOP	CAT NO	ITEM NUMBER	UNIT PRICE	AMOUNT
<p>STATE PERSONNEL IS NOT BINDING, INCLUDING THAT MADE DURING SITE VISITS. TECHNICAL QUESTIONS RESULTING FROM SITE VISITS MUST BE SUBMITTED IN ACCORDANCE WITH THE ABOVE PROVISIONS. ONLY INFORMATION ISSUED IN WRITING AND ADDED TO THE RFQ SPECIFICATIONS BY AN OFFICIAL WRITTEN ADDENDUM BY PURCHASING IS BINDING.</p> <p>EXHIBIT 10</p> <p>REQUISITION NO.: GSD116661.....</p> <p>ADDENDUM ACKNOWLEDGEMENT</p> <p>I HEREBY ACKNOWLEDGE RECEIPT OF THE FOLLOWING CHECKED ADDENDUM(S) AND HAVE MADE THE NECESSARY REVISIONS TO MY PROPOSAL, PLANS AND/OR SPECIFICATION, ETC.</p> <p>ADDENDUM NO.'S:</p> <p>NO. 1 .....</p> <p>NO. 2 .....</p> <p>NO. 3 .....</p> <p>NO. 4 .....</p> <p>NO. 5 .....</p> <p>I UNDERSTAND THAT FAILURE TO CONFIRM THE RECEIPT OF THE ADDENDUM(S) MAY BE CAUSE FOR REJECTION OF BIDS.</p> <p>VENDOR MUST CLEARLY 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</p>						

SEE REVERSE SIDE FOR TERMS AND CONDITIONS

SIGNATURE <i>[Signature]</i>	TELEPHONE 315 355-3300	DATE 1-26-2011
TITLE Commercial Operations	FERN 23-1503731	ADDRESS CHANGES TO BE NOTED ABOVE

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



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

# Request for Quotation

RFQ NUMBER  
**GSD116661**

PAGE  
**3**

ADDRESS CORRESPONDENCE TO ATTENTION OF  
**KRISTA FERRELL**  
**304-558-2596**

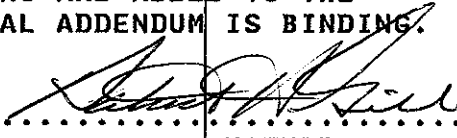
RFQ COPY  
 TYPE NAME/ADDRESS HERE

DEPARTMENT OF ADMINISTRATION  
 VARIOUS LOCALES AS INDICATED  
 BY ORDER

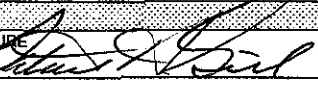
PURCHASER

SHIP TO

DATE PRINTED	TERMS OF SALE	SHIP VIA	FOB	FREIGHT TERMS
12/29/2010				
BID OPENING DATE: 01/27/2011		BID OPENING TIME 01:30PM		

LINE	QUANTITY	UOP	CAT. NO	ITEM NUMBER	UNIT PRICE	AMOUNT
<p>INFORMATION ISSUED IN WRITING AND ADDED TO THE SPECIFICATIONS BY AN OFFICIAL ADDENDUM IS BINDING.</p> <p style="text-align: center;">             .....            SIGNATURE            GE Betz, Inc            .....            COMPANY            January 26, 2011            .....            DATE         </p> <p>NOTE: THIS ADDENDUM ACKNOWLEDGEMENT SHOULD BE SUBMITTED WITH THE BID.</p> <p>REV. 09/21/2009</p> <p>EXHIBIT 1</p> <p>LIFE OF CONTRACT: THIS CONTRACT BECOMES EFFECTIVE UPON AWARD AND EXTENDS FOR A PERIOD OF ONE (1) YEAR OR UNTIL SUCH "REASONABLE TIME" THEREAFTER AS IS NECESSARY TO OBTAIN A NEW CONTRACT OR RENEW THE ORIGINAL CONTRACT. THE "REASONABLE TIME" PERIOD SHALL NOT EXCEED TWELVE (12) MONTHS. DURING THIS "REASONABLE TIME" THE VENDOR MAY TERMINATE THIS CONTRACT FOR ANY REASON UPON GIVING THE DIRECTOR OF PURCHASING 30 DAYS WRITTEN NOTICE.</p> <p>UNLESS SPECIFIC PROVISIONS ARE STIPULATED ELSEWHERE IN THIS CONTRACT DOCUMENT, THE TERMS, CONDITIONS, AND PRICING SET HEREIN ARE FIRM FOR THE LIFE OF THE CONTRACT.</p>						

SEE REVERSE SIDE FOR TERMS AND CONDITIONS

SIGNATURE 	TELEPHONE 215-385-3300	DATE 1/26/2011
TYPE Commercial Operation		FEIN 23-1503731

ADDRESS CHANGES TO BE NOTED ABOVE

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



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

# Request for Quotation

RFQ NUMBER  
**GSD116661**

PAGE  
**4**

ADDRESS CORRESPONDENCE TO ATTENTION OF  
**KRISTA FERRELL  
 304-558-2596**

RFQ COPY  
 TYPE NAME/ADDRESS HERE

DEPARTMENT OF ADMINISTRATION  
 VARIOUS LOCALES AS INDICATED  
 BY ORDER

VENDOR

SHIP TO

DATE PRINTED	TERMS OF SALE	SHIP VIA	F.O.B.	FREIGHT TERMS
12/29/2010				

BID OPENING DATE: **01/27/2011** BID OPENING TIME **01:30PM**

LINE	QUANTITY	UOP	CAT. NO.	ITEM NUMBER	UNIT PRICE	AMOUNT
<p><b>RENEWAL: THIS CONTRACT MAY BE RENEWED UPON THE MUTUAL WRITTEN CONSENT OF THE SPENDING UNIT AND VENDOR, SUBMITTED TO THE DIRECTOR OF PURCHASING THIRTY (30) DAYS PRIOR TO THE EXPIRATION DATE. SUCH RENEWAL SHALL BE IN ACCORDANCE WITH THE TERMS AND CONDITIONS OF THE ORIGINAL CONTRACT AND SHALL BE LIMITED TO TWO (2) SUCCESSIVE ONE (1) YEAR PERIODS.</b></p> <p><b>CANCELLATION: THE DIRECTOR OF PURCHASING RESERVES THE RIGHT TO CANCEL THIS CONTRACT IMMEDIATELY UPON WRITTEN NOTICE TO THE VENDOR IF THE COMMODITIES AND/OR SERVICES SUPPLIED ARE OF AN INFERIOR QUALITY OR DO NOT CONFORM WITH THE SPECIFICATIONS OF THE BID AND CONTRACT HEREIN.</b></p> <p><b>OPEN MARKET CLAUSE: THE DIRECTOR OF PURCHASING MAY AUTHORIZE A SPENDING UNIT TO PURCHASE ON THE OPEN MARKET, WITHOUT THE FILING OF A REQUISITION OR COST ESTIMATE, ITEMS SPECIFIED ON THIS CONTRACT FOR IMMEDIATE DELIVERY IN EMERGENCIES DUE TO UNFORESEEN CAUSES (INCLUDING BUT NOT LIMITED TO DELAYS IN TRANSPORTATION OR AN UNANTICIPATED INCREASE IN THE VOLUME OF WORK).</b></p> <p><b>INSURANCE: SUCCESSFUL VENDOR SHALL FURNISH PROOF OF COVERAGE OF COMMERCIAL GENERAL LIABILITY INSURANCE PRIOR TO ISSUANCE OF THE CONTRACT. UNLESS OTHERWISE SPECIFIED IN THE BID DOCUMENTS, THE MINIMUM AMOUNT OF INSURANCE COVERAGE REQUIRED IS \$250,000.</b></p> <p><b>WORKER'S COMPENSATION: VENDOR IS REQUIRED TO PROVIDE A CERTIFICATE FROM WORKER'S COMPENSATION IF SUCCESSFUL.</b></p> <p><b>BANKRUPTCY: IN THE EVENT THE VENDOR/CONTRACTOR FILES FOR BANKRUPTCY PROTECTION, THIS CONTRACT IS AUTOMATICALLY NULL AND VOID, AND IS TERMINATED WITHOUT FURTHER ORDER.</b></p>						

SEE REVERSE SIDE FOR TERMS AND CONDITIONS

SIGNATURE <i>[Signature]</i>	TELEPHONE 255 350-3300	DATE 1/24/2011
TITLE Commercial Operations	FEIN 23-1503731	ADDRESS CHANGES TO BE NOTED ABOVE

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



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

# Request for Quotation

RFQ NUMBER  
**GSD116661**

PAGE  
**5**

ADDRESS CORRESPONDENCE TO ATTENTION OF  
**KRISTA FERRELL  
 304-558-2596**

RFQ COPY  
 TYPE NAME/ADDRESS HERE

VENDOR

SHIP TO

DEPARTMENT OF ADMINISTRATION  
 VARIOUS LOCALES AS INDICATED  
 BY ORDER

DATE PRINTED	TERMS OF SALE	SHIP VIA	F.O.B.	FREIGHT TERMS
12/29/2010				

BID OPENING DATE: **01/27/2011** BID OPENING TIME **01:30PM**

LINE	QUANTITY	UOP	CAT. NO.	ITEM NUMBER	UNIT PRICE	AMOUNT
<p>REV. 9/98</p> <p>PURCHASING CARD ACCEPTANCE: THE STATE OF WEST VIRGINIA CURRENTLY UTILIZES A VISA PURCHASING CARD PROGRAM WHICH IS ISSUED THROUGH A BANK. THE SUCCESSFUL VENDOR MUST ACCEPT THE STATE OF WEST VIRGINIA VISA PURCHASING CARD FOR PAYMENT OF ALL ORDERS PLACED BY ANY STATE AGENCY AS A CONDITION OF AWARD.</p> <p>NOTICE</p> <p>A SIGNED BID MUST BE SUBMITTED TO:</p> <p>DEPARTMENT OF ADMINISTRATION            PURCHASING DIVISION            BUILDING 15            2019 WASHINGTON STREET, EAST            CHARLESTON, WV 25305-0130</p> <p>THE BID SHOULD CONTAIN THIS INFORMATION ON THE FACE OF THE ENVELOPE OR THE BID MAY NOT BE CONSIDERED:</p> <p>SEALED BID</p> <p>BUYER: KRISTA FERRELL-FILE 21</p> <p>RFQ. NO.: GSD116661</p> <p>BID OPENING DATE: 01/27/2011</p>						

SEE REVERSE SIDE FOR TERMS AND CONDITIONS

SIGNATURE <i>Krista Ferrell</i>	TELEPHONE 75-355-3300	DATE 1/26/2011
TITLE Contract Operations	FEN 23-1503731	ADDRESS CHANGES TO BE NOTED ABOVE

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



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

# Request for Quotation

RFQ NUMBER  
**GSD116661**

PAGE  
**6**

ADDRESS CORRESPONDENCE TO ATTENTION OF  
**KRISTA FERRELL  
 304-558-2596**

RFQ COPY  
 TYPE NAME/ADDRESS HERE

VENDOR

SHIP TO

DEPARTMENT OF ADMINISTRATION  
 VARIOUS LOCALES AS INDICATED  
 BY ORDER

DATE PRINTED	TERMS OF SALE	SHIP VIA	FOB	FREIGHT TERMS
12/29/2010				

BID OPENING DATE: **01/27/2011** BID OPENING TIME **01:30PM**

LINE	QUANTITY	UOP	CAT NO.	ITEM NUMBER	UNIT PRICE	AMOUNT
<p><b>BID OPENING TIME: 1:30 PM</b></p> <p><b>PLEASE PROVIDE A FAX NUMBER IN CASE IT IS NECESSARY TO CONTACT YOU REGARDING YOUR BID:</b>            215-942-3788 (Diane Kun)</p> <p>-----</p> <p><b>CONTACT PERSON (PLEASE PRINT CLEARLY):</b>            Patrick Gill 724-272-2494</p> <p>-----</p>						
<p>***** THIS IS THE END OF RFQ GSD116661 *****</p> <p>Per GE Betz, Inc. Proposal#48748319</p>						<p><b>TOTAL: 60,134</b></p>

SEE REVERSE SIDE FOR TERMS AND CONDITIONS

SIGNATURE <i>Diane Kun</i>	TELEPHONE 215-355-3300	DATE 1-26-2011
----------------------------	------------------------	----------------

TITLE <b>Commercial Operations</b>	FEIN <b>23-1503731</b>	ADDRESS CHANGES TO BE NOTED ABOVE
------------------------------------	------------------------	-----------------------------------

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

## GENERAL TERMS & CONDITIONS REQUEST FOR QUOTATION (RFQ) AND REQUEST FOR PROPOSAL (RFP)

1. Awards will be made in the best interest of the State of West Virginia.
2. The State may accept or reject in part, or in whole, any bid.
3. Prior to any award, the apparent successful vendor must be properly registered with the Purchasing Division and have paid the required \$125 fee.
4. All services performed or goods delivered under State Purchase Order/Contracts are to be continued for the term of the Purchase Order/Contracts, contingent upon funds being appropriated by the Legislature or otherwise being made available. In the event funds are not appropriated or otherwise available for these services or goods this Purchase Order/Contract becomes void and of no effect after June 30.
5. Payment may only be made after the delivery and acceptance of goods or services.
6. Interest may be paid for late payment in accordance with the *West Virginia Code*.
7. Vendor preference will be granted upon written request in accordance with the *West Virginia Code*.
8. The State of West Virginia is exempt from federal and state taxes and will not pay or reimburse such taxes.
9. The Director of Purchasing may cancel any Purchase Order/Contract upon 30 days written notice to the seller.
10. The laws of the State of West Virginia and the *Legislative Rules* of the Purchasing Division shall govern the purchasing process.
11. Any reference to automatic renewal is hereby deleted. The Contract may be renewed only upon mutual written agreement of the parties.
12. **BANKRUPTCY:** In the event the vendor/contractor files for bankruptcy protection, the State may deem this contract null and void, and terminate such contract without further order.
13. **HIPAA BUSINESS ASSOCIATE ADDENDUM:** The West Virginia State Government HIPAA Business Associate Addendum (BAA), approved by the Attorney General, is available online at [www.state.wv.us/admin/purchase/vrc/hipaa.htm](http://www.state.wv.us/admin/purchase/vrc/hipaa.htm) and is hereby made part of the agreement. Provided that the Agency meets the definition of a Cover Entity (45 CFR §160.103) and will be disclosing Protected Health Information (45 CFR §160.103) to the vendor.
14. **CONFIDENTIALITY:** The vendor agrees that he or she 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/noticeConfidentiality.pdf>.
15. **LICENSING:** Vendors 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, and the West Virginia Insurance Commission. The vendor must provide all necessary releases to obtain information to enable the director or spending unit to verify that the vendor is licensed and in good standing with the above entities.
16. **ANTITRUST:** In submitting a bid to any agency for the State of West Virginia, the bidder offers and agrees that if the bid is accepted the bidder will 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 the bidder.

I certify that this bid is made without prior understanding, agreement, or connection with any corporation, firm, limited liability company, partnership, or person or entity submitting a bid for the same material, supplies, equipment or services and is in all respects fair and without collusion or Fraud. I further certify that I am authorized to sign the certification on behalf of the bidder or this bid.

### INSTRUCTIONS TO BIDDERS

1. Use the quotation forms provided by the Purchasing Division. Complete all sections of the quotation form.
2. Items offered must be in compliance with the specifications. Any deviation from the specifications must be clearly indicated by the bidder. Alternates offered by the bidder as **EQUAL** to the specifications must be clearly defined. A bidder offering an alternate should attach complete specifications and literature to the bid. The Purchasing Division may waive minor deviations to specifications.
3. Unit prices shall prevail in case of discrepancy. All quotations are considered F.O.B. destination unless alternate shipping terms are clearly identified in the quotation.
4. All quotations must be delivered by the bidder to the office listed below prior to the date and time of the bid opening. Failure of the bidder to deliver the quotations on time will result in bid disqualifications: Department of Administration, Purchasing Division, 2019 Washington Street East, P.O. Box 50130, Charleston, WV 25305-0130
5. Communication during the solicitation, bid, evaluation or award periods, except through the Purchasing Division, is strictly prohibited (W.Va. C.S.R. §148-1-6.6).

**REQUEST FOR QUOTATIONS #GSD116661  
WATER TREATMENT SERVICES  
DEPARTMENT OF ADMINISTRATION-OWNED FACILITIES  
GENERAL SERVICES DIVISION  
1900 Kanawha Boulevard, East  
Charleston, WV**

Location: West Virginia Department of Administration  
Buildings Listed Herein

For: State of West Virginia  
General Services Division  
1900 Kanawha Boulevard, East  
Charleston, West Virginia 25305

This Request for Quotation also includes the following documents:

1. Attachment A: GSD116661 Bid Form
2. Attachment B: GSD116661 Location Schedule

Bidders can arrange site visits prior to the bid opening date by contacting Dave Parsons, Operations & Maintenance Manager, GSD, at (304)558-0689 or email [David.K.Parsons@wv.gov](mailto:David.K.Parsons@wv.gov).

**SECTION 1: DEFINITIONS**

- A. The Department of Administration, General Services Division, State Capitol Complex, Building 1, Room MB-60, Charleston, West Virginia 25305, shall be referred to as "the Agency."
- B. The successful bidder or vendor shall be called the "Contractor."
- C. The "Contract" shall refer to the binding agreement that is entered into between the State of West Virginia and the Contractor to provide the services as herein specified.
- D. "Agency Representative" shall be defined as the person designated by the Director of the General Services Division as having authority to act on behalf of the General Services Division.
- E. Days designated by W.Va. Code §2-2-1 as legal holidays (i.e. new Year's Day, Martin Luther King's Birthday, President's Day, Memorial Day, West Virginia Day, Independence Day, Labor Day, Columbus Day, Veteran's Day, Thanksgiving Day, Lincoln's Day, and Christmas Day).



- F. "Testing" means the Contractor shall perform a water quality test upon the completion of an ordered treatment to ensure water quality meets the technical specifications required in Section 3.

## **SECTION 2: SCOPE OF WORK**

The Contractor shall provide monthly water treatment, testing, and quarterly Legionella testing service as set forth and in accordance with all applicable federal, state, and local regulations in buildings owned and operated by the West Virginia Department of Administration. The water treatment program is to include all boiler systems, cooling towers, chillers, water loops, condensate lines and tanks or other systems identified by General Services.

### **2.1 Regular Maintenance Services:**

The Vendor shall establish a monthly preventative program to eliminate or minimize corrosion and the formation of adherent mineral deposits in the boilers, steam lines, valves, heat exchangers, traps, condensate systems and heat transfer surfaces of related equipment.

The Vendor shall also establish a monthly preventative program to eliminate or minimize corrosion, the formation of adherent mineral deposits, algae and slime formation and bacterial growth on heat transfer surfaces in re-circulating water line circuits including cooling towers, closed chilled water and hot water systems and closed -loop heat pump systems.

The Vendor shall provide on-site scientific expertise to analyze problems relating to water treatment discovered during maintenance activities.

### **2.2 Quarterly Legionella Testing:**

The Vendor will perform monthly testing on all specifications (section G) with the exception of Legionella which will be performed quarterly in accordance with AIHA and ASTM guidelines. Legionella will be tested at all closed loops, towers and all other sites in which towers are present. Test results will be provided to GSD at no additional cost. All testing cost associated with this contract should be incorporated into the bid form.

### **2.3 Equipment and Chemicals:**

All equipment and chemicals used for water treatment must be in conformance with all applicable federal, state, and local regulations. Vendors shall utilize a water-usage based program utilizing meters and post-bleed controllers.

All chemical feed equipment is to be installed by the vendor at no additional charge to The State of West Virginia and maintained by the vendor during the duration of the service contract. Equipment is to be installed within **45** days from the effective date of the contract. The Contractor shall provide staff and materials to maintain proper systems treatment by manual means until such time equipment is installed.

The Contractor shall furnish the following information prior to award of the contract:

- Detailed list of the equipment to be used and method of delivery into the various systems
- Copies of all MSDS of chemicals/products to be utilized shall be furnished to the safety department prior to introduction of product onto the premises.

All discharges into the sewage system from cooling tower bleed-off, boiler blow down or system draining must meet all federal, state and local regulations. The use of molybdates is prohibited.

### **2.4 Costs**

**Treatment and Testing Services:** The Contractor shall provide an all inclusive flat monthly rate for all services to be included under this Contract. This monthly rate shall include all Treatment and Testing Services. The Contractor shall be responsible for all treatment chemicals associated with the performance and specifications, located in of this Contract. The Contractor shall be responsible for all mileage and travel costs, including travel time, associated with the performance of this Contract.

**All travel costs must be incorporated into the monthly cost bid.**

### **2.5 Facility Access:**

The Agency will permit access to the facilities and will allow the Contractor to utilize shop facilities. Access keys will be provided to the Contractor and inventoried by the Agency. The Contractor must sign for all access keys and return them upon expiration of this Contract.

Work will be performed during normal business hours, 8:00am to 5:00 pm. Monday through Friday excluding State recognized holidays.

## 2.6 Facilities

**The Agency maintains buildings throughout the State, with the majority located in the Charleston metro area. A listing of facilities for which service may be requested is located in Attachment B. The Agency reserves the right to not request service in any of the buildings covered by this Contract. Statewide buildings may be added to this list during the life of the Contract only by mutual agreement of both the Agency and the Contractor, through formal change order. The Contractor shall service added buildings under the same terms and conditions contained herein.**

## **SECTION 3: WATER QUALITY TECHNICAL SPECIFICATIONS**

3.1 Closed hydronic systems, including hot-water heating and chilled water, shall have the following water qualities:

- A. pH: Maintain a value within 9.0 to 10.5
- B. "P" Alkalinity: Maintain a value within 100 to 500 ppm.
- C. Boron: Maintain a value within 100 to 200 ppm.
- D. Chemical Oxygen Demand: Maintain a maximum value of 100 ppm.
- E. Soluble Copper: Maintain a maximum value of 0.20 ppm.
- F. TDS: Maintain at 3000 ppm with a maximum of 5000 ppm.
- G. Ammonia: maintain a maximum value of 20 ppm.
- H. Free caustic alkalinity: Maintain a maximum value of 20 ppm.
- I. Microbiological Limits:
  - 1) Total Aerobic Plate Count: Maintain a maximum value of 1000 organisms/ml.
  - 2) Total Anaerobic Plate Count: Maintain a maximum value of 100 organisms per ml.
  - 3) Nitrate Reducers: Maintain a maximum value of 100 organisms per ml.
  - 4) Sulfate Reducers: Maintain a maximum value of 0 organisms per ml.
  - 5) Iron Bacteria: Maintain a maximum value of 0 organisms per ml.

3.2 Steam boiler systems and steam condensate systems shall have the following water qualities:

- A. Steam Condensate:
  - 1) pH: Maintain a value within 7.8 to 8.4

- 2) Total Alkalinity: Maintain a value within 5 to 50 ppm.
- 3) Chemical Oxygen Demand: Maintain a maximum value of 15ppm.
- 4) Soluble Copper: Maintain a maximum value of 0.20 ppm.
- 5) TDS: Maintain a maximum value of 100 ppm.
- 6) Ammonia: Maintain a maximum value of 20 ppm.
- 7) Total Hardness: Maintain a maximum value of 2 ppm.

B. Steam boilers operating at 15 psig and less shall have the following water qualities:

- 1) "OH" Alkalinity: maintain a value within 200 to 400 ppm.
- 2) TDS: Maintain a value within 600 to 3000 ppm.

C. Steam boilers operating at more than 15 psig shall have the following water qualities:

- 1) "OH" Alkalinity: 200 to 400 ppm.
- 2) TDS: Maintain a value within 600 to 1200 ppm to a maximum 30 times return water TDS.

3.3 Passivation for galvanized steel for the first 60 days of operation.

- A. pH: Maintain a value within 7 to 8.
- B. Calcium Carbonate Hardness: Maintain a value within 100 to 300 ppm.
- C. Calcium Carbonate Alkalinity: Maintain a value within 100 to 300 ppm.

#### **SECTION 4: RELEASE ORDERS AND INVOICING**

##### **4.1 Release Orders**

Prior to beginning any work the Agency will issue a written release order to the Contractor. This release order shall have a unique number and reference the master contract number for the master contract. Issuance of the release order to the Contractor shall be considered authorization to perform said service. No work other than that specified on the individual release order shall be undertaken by the Contractor.

The Contractor shall provide the Agency with valid email addresses and fax numbers to which release orders may be communicated.

#### **4.2 Invoices**

Invoices shall be submitted to the Agency for payment monthly (in arrears) and must include the following information:

1. Copies of all service orders or inspection reports signed and dated by the Agency Representative (prior to their submittal with invoices for payment).
2. FEIN number, complete address of vendor, Agency release order number, and master contract number.

Invoices shall be mailed to the following address:

Department of Administration  
General Services Division  
State Capitol Complex  
Building 1, Room MB-68  
1900 Kanawha Blvd. E.  
Charleston, West Virginia 25305

Should the Contractor be requested by the Agency or volunteer to submit invoices electronically, invoices must meet the digital requirements of the WV State Auditor's Office.

#### **SECTION 5: ADDITIONAL TERMS AND CONDITIONS**

5.1: The relationship of the Contractor to the State of West Virginia shall be that of an independent contractor and no principal-agent relationship or employer-employee relationship is contemplated or created by the parties to this Contract. The Contractor, as an independent contractor, is solely liable for the acts and omissions of its employees and agents. The Contractor will be responsible for selecting, supervising, and compensating any and all individuals employed pursuant to the terms of this Contract. Neither the Contractor nor any employees or sub-contractors of the Contractor shall be deemed to be employees of the State for any purposes whatsoever. The wages and salaries, taxes, withholding payments, penalties, fees, fringe benefits, professional liability insurance premiums, contributions to insurance and pension or other deferred obligations, and licensing fees, etc., and the filing of all necessary documents, forms and returns pertinent to all of the foregoing are the Contractor's responsibility. The Contractor shall hold harmless the State of West Virginia and the Agency and shall provide the State of West Virginia and

the 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. The Contractor shall not assign, convey, transfer, sub-contract, or delegate any of its responsibilities and obligations under this Contract to any person, corporation, partnership, association, or entity without express written consent of the Agency.

5.2: Indemnification: The Contractor 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 Contractor, 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 Contractor, its officers, employees or sub-contractors to observe state and federal laws, including but not limited to labor and wage laws.

5.3: The Contractor further agrees to comply with the Civil Rights Act of 1964 and all other applicable federal, state, and local government regulations.

5.4: All work, materials, and equipment shall comply with the rules and safety regulations of all codes and ordinances of local, state and federal authorities. At a minimum, the services and repairs shall comply with the current editions in effect 30 days prior to receipt of bids of the following codes:

5.5: The Contractor shall procure all necessary permits and licenses to comply with all applicable laws, federal, state, or municipal, along with all regulations, and ordinances of any regulating body.

5.6: The Contractor shall pay any applicable sales, use, or personal property taxes arising out of this Contract and the transactions contemplated thereby. Any other taxes levied upon this Contract, the transaction, or the equipment, or services delivered pursuant hereto shall be borne by the Contractor. It is clearly understood that the State of West Virginia is exempt from any taxes regarding performance of the scope of work of this Contract.

**SECTION 6: AWARD CRITERIA**

The State of West Virginia shall award this Contract according to the following award criteria. Failure to bid any of the factors in the formulation of the total bid will result in the disqualification of the entire quote (however, bids of "\$0.00" will be acceptable as indication that the vendor intends to not charge for the listed services).

**The following formula shall be used to award the Contract:**

**A + B = C (Your Bid, Annual Cost of Services)**

The following is a **sample** bid tabulation, only for reference:

**Standard Testing and Treatment**

LOCATION	Monthly Cost	Qty	Yearly Cost
<u>Capitol Complex Campus</u>			
Bldg. 1 Main Capitol Bldg	\$100.00	12	\$1,200.00
Bldg. 2 DMV Bldg	\$50.00	12	\$600.00
Bldg 4 112 California Avenue	\$200.00	12	\$2,400.00
Bldg. 5 Highways	\$2,000.00	12	\$24,000.00
Bldg. 6 Education	\$100.00	12	\$1,200.00
Bldg. 8 Governor's Mansion	\$50.00	12	\$600.00
Bldg. 11 Chilled Water Plant	\$300.00	12	\$3,600.00
Bldg. 17 Finance(2101 Wash St.)	\$250.00	12	\$3,000.00
<u>Off Campus</u>			
Bldg. 22 Tax & Revenue	\$200.00	12	\$2,400.00
Bldg. 23 Beckley (407 Nevill St)	\$300.00	12	\$3,600.00
Bldg. 25 Parkersburg (5th & Avery)	\$250.00	12	\$3,000.00
Bldg. 36 One Davis Square	\$300.00	12	\$3,600.00
Bldg. 37 DEP (Kanawha City)	\$1,500.00	12	\$18,000.00
Bldg. 86 Greenbrooke (Smith St)	\$500.00	12	\$6,000.00
Rehab Center (Institute, WV)	\$1,000.00	12	\$12,000.00
<b>TOTAL ANNUAL STANDARD</b>			<b><u>\$85,200.00 (A)</u></b>

***Legionella Testing***

LOCATION	# of Tests	Price per Test Per Facility	Quarterly Cost	Qty.	Yearly Cost
<b><u>Capitol Complex Campus</u></b>					
Bldg. 4 (112 California Avenue)	1	\$120.00	\$120.00	4	\$480.00
Bldg. 5 Highways	1	\$120.00	\$120.00	4	\$480.00
Bldg. 6 Education	1	\$120.00	\$120.00	4	\$480.00
Bldg. 11 Chilled Water Plant	6	\$120.00	\$720.00	4	\$2,880.00
Bldg. 17 Finance(2101 Wash St.)	2	\$120.00	\$240.00	4	\$960.00
<b><u>Off Campus</u></b>					
Bldg. 22 Tax & Revenue	2	\$120.00	\$240.00	4	\$960.00
Bldg. 23 Beckley (407 Nevill St)	1	\$120.00	\$120.00	4	\$480.00
Bldg. 25 Parkersburg (5th & Avery)	2	\$120.00	\$240.00	4	\$960.00
Bldg. 36 One Davis Square	3	\$120.00	\$360.00	4	\$1,440.00
Bldg. 37 DEP (Kanawha City)	3	\$120.00	\$360.00	4	\$1,440.00
Bldg. 86 Greenbrooke (Smith St)	1	\$120.00	\$120.00	4	\$480.00
Rehab Center (Institute, WV)	4	\$120.00	\$480.00	4	\$1,920.00
<b>TOTAL ANNUAL LEGIONELLA</b>					<b><u>\$12,960.00 (B)</u></b>
<b>TOTAL BID (A + B) = C</b>					<b><u>\$98,160.00 (C)</u></b>



# GSD116661-Attachment A-Bid Form

**Standard Testing and Treatment**

LOCATION	Monthly Cost	Qty	Yearly Cost
<u>Capitol Complex Campus</u>			
Bldg. 1 Main Capitol Bldg	\$ <u>52.50</u>	12	\$ <u>630.00</u>
Bldg. 2 DMV Bldg	\$ <u>52.50</u>	12	\$ <u>630.00</u>
Bldg. 4 112 California Avenue	\$ <u>52.50</u>	12	\$ <u>630.00</u>
Bldg. 5 Highways	\$ <u>1,011.67</u>	12	\$ <u>12,140.00</u>
Bldg. 6 Education	\$ <u>52.50</u>	12	\$ <u>630.00</u>
Bldg. 8 Governor's Mansion	\$ <u>52.50</u>	12	\$ <u>630.00</u>
Bldg. 11 Chilled Water Plant	\$ <u>52.50</u>	12	\$ <u>630.00</u>
Bldg. 17 Finance(2101 Wash St.)	\$ <u>52.50</u>	12	\$ <u>630.00</u>
 <u>Off Campus</u>			
Bldg. 22 Tax & Revenue	\$ <u>52.50</u>	12	\$ <u>630.00</u>
Bldg. 23 Beckley (407 Nevill St)	\$ <u>52.50</u>	12	\$ <u>630.00</u>
Bldg. 25 Parkersburg (5th & Avery)	\$ <u>52.50</u>	12	\$ <u>630.00</u>
Bldg. 36 One Davis Square	\$ <u>52.50</u>	12	\$ <u>630.00</u>
Bldg. 37 DEP (Kanawha City)	\$ <u>787.60</u>	12	\$ <u>9,450.00</u>
Bldg. 86 Greenbrooke (Smith St)	\$ <u>129.67</u>	12	\$ <u>1,536.00</u>
Rehab Center (Institute, WV)	\$ <u>182.83</u>	12	\$ <u>2,194.00</u>
TOTAL ANNUAL STANDARD			<u>\$32,270.00 (A)</u>

**Legionella Testing**

LOCATION	# of Tests	Price per Test Per Facility	Quarterly Cost	Qty.	Yearly Cost
<u>Capitol Complex Campus</u>					
Bldg. 4 (112 California Avenue)	1	\$ <u>258.00</u>	\$ <u>258.00</u>	4	\$ <u>1,032.00</u>
Bldg. 5 Highways	1	\$ <u>258.00</u>	\$ <u>258.00</u>	4	\$ <u>1,032.00</u>
Bldg. 6 Education	1	\$ <u>258.00</u>	\$ <u>258.00</u>	4	\$ <u>1,032.00</u>
Bldg. 11 Chilled Water Plant	6	\$ <u>258.00</u>	\$ <u>1,548.00</u>	4	\$ <u>6,192.00</u>
Bldg. 17 Finance(2101 Wash St.)	2	\$ <u>258.00</u>	\$ <u>516.00</u>	4	\$ <u>2,064.00</u>
 <u>Off Campus</u>					
Bldg. 22 Tax & Revenue	2	\$ <u>258.00</u>	\$ <u>516.00</u>	4	\$ <u>2,064.00</u>
Bldg. 23 Beckley (407 Nevill St)	1	\$ <u>258.00</u>	\$ <u>258.00</u>	4	\$ <u>1,032.00</u>
Bldg. 25 Parkersburg (5th & Avery)	2	\$ <u>258.00</u>	\$ <u>516.00</u>	4	\$ <u>2,064.00</u>
Bldg. 36 One Davis Square	3	\$ <u>258.00</u>	\$ <u>774.00</u>	4	\$ <u>3,096.00</u>
Bldg. 37 DEP (Kanawha City)	3	\$ <u>258.00</u>	\$ <u>774.00</u>	4	\$ <u>3,096.00</u>
Bldg. 86 Greenbrooke (Smith St)	1	\$ <u>258.00</u>	\$ <u>258.00</u>	4	\$ <u>1,032.00</u>
Rehab Center (Institute, WV)	4	\$ <u>258.00</u>	\$ <u>1,032.00</u>	4	\$ <u>4,128.00</u>
TOTAL ANNUAL LEGIONELLA					<u>\$27,864.00 (B)</u>
TOTAL BID (A + B) = C					<u>\$40,134.00 (C)</u>

LOCATION SCHEDULE  
ATTACHMENT C

**GSD 116661 Attachment B**

**Location Schedule**

<b>Building Location</b>	<b>System</b>
<b>Capitol Complex</b>	
1. Building 1, Main Capitol, Basement	Loop Ch water/ steam reduce. Sta
3. Building 3, DMV, Basement	Loop Ch water/ steam reduce. Sta
4. 112 California Avenue	Loop Ch water/ steam reduce. Sta
5. Building 5, Highways,	3 Bryan boilers, chill loop, water softening station
6. Building 6, Education	10 n900 boilers/chill loop
8. Building 8, Governor's Mansion	Loop Ch water/ steam reduce. Sta
11. Chilled Water Plant	Chill loop/ Towers (Dolphin) treated, test ONLY & Legionella
17. Finance (2101 Washington Street)	21 water loop heat pumps
22. Tax and Revenue (1001 Lee St.)	Closed chill water loop- 2 boilers
23. Beckley (407 Neville St.)	Hydronic heat pumps- 1 boiler- tower
25. Parkersburg (5th and Avery St.)	Hydronic heat pums- 2 boilers- tower
36. One Davis Square (Charleston)	Loop chilled water-tower-boiler
37. DEP (Kanawha City)	Kinetco water units-2 mammoth boilers (test mammoth unit)
86. Greenbrooke (1124 Smith St, Chas.)	1 boiler, 25 water source heat pump, 4 towers, 1 cooling loop
<b>Rehab Center (Institute, WV)</b>	
A, C, E, F, K Building	1 cooling tower, 10 closed loops, 2 cold, 8 hot.

# 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.

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: CE Betz, Inc

Signed: [Signature]

Date: 01/26/2011

Title: Sales Manager

\*Check any combination of preference consideration(s) indicated above, which you are entitled to receive.

RFQ No. GSD116661

STATE OF WEST VIRGINIA  
Purchasing Division

**PURCHASING AFFIDAVIT**

**West Virginia Code §5A-3-10a states:** 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 the debt owed is an amount greater than one thousand dollars in the aggregate.

**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.

"Debtor" means any individual, corporation, partnership, association, limited liability company or any other form or business association owing a debt to the state or any of its political subdivisions. "Political subdivision" means any county commission; municipality; county board of education; any instrumentality established by a county or municipality; any separate corporation or instrumentality established by one or more counties or municipalities, as permitted by law; or any public body charged by law with the performance of a government function or whose jurisdiction is coextensive with one or more counties or municipalities. "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 exceeds five percent of the total contract amount.

**EXCEPTION:** The prohibition of this section does not apply where a vendor has contested any tax administered pursuant to chapter eleven of this 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.

Under penalty of law for false swearing (*West Virginia Code §61-5-3*), it is hereby certified that the vendor affirms and acknowledges the information in this affidavit and is in compliance with the requirements as stated.

**WITNESS THE FOLLOWING SIGNATURE**

Vendor's Name: GE BETZ, INC.

Authorized Signature: [Signature] Date: 01/25/11

State of PA

County of BUCKS, to-wit:

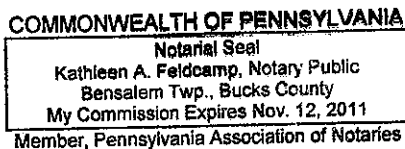
Taken, subscribed, and sworn to before me this 25<sup>th</sup> day of January, 2011

My Commission expires Nov. 12, 2011, 20  .

**AFFIX SEAL HERE**

**NOTARY PUBLIC**

Kathleen A. Feldcamp



GE Power & Water  
Water & Process Technologies

**Water Treatment Proposal  
Request for Quotation #GSD116661**

**Department of Administration-Owned Facilities,  
General Services Division  
Charleston, WV**



**GE Proposal #**  
January 26, 2011

Prepared by:  
Patrick Gill  
Diane L. Kun, Commercial Operations

GE Power & Water  
Water & Process Technologies

**Table of Contents**

**Section 1 - Executive Summary ..... 4**

**Section 2 - Commercial Offer ..... 5**  
Pricing Summary ..... 5

**Section 3 - Transition Plan..... 6**

**Section 4 – Service Highlights ..... 8**  
GE Water & Process Technologies Cooling Service Description ..... 8

**Section 5 – GE Qualifications ..... 11**  
Company Overview ..... 11

**Section 6 – Contract Page..... 13**

**Section 7 – Terms and Conditions ..... 14**

**Appendices ..... 15**

GE Power & Water  
Water & Process Technologies

## **Confidentiality**

The observations, determinations, formulation information of GE Water & Process Technologies products, and recommendations presented in this proposal are the work product of GE and its affiliates (collectively referred to hereinafter as "Confidential Information"), and are provided solely with the understanding and Customer agreement that the information contained in this document is submitted for evaluation by Customer only. Customer agrees not to reveal its contents except to those in Customer's organization necessary for evaluation. Copies of this document may not be made without the prior written consent of GE. If the preceding is not acceptable to Customer, this document shall be returned to Contractor.

## **Additional Proposal Details**

This proposal is offered by:

GE Betz, Inc.  
4636 Somerton Road  
Trevose, PA 19053

Pricing will be valid for 30 days.

It is the policy of GE Betz, Inc, doing business as GE Water and Process Technologies; to negotiate the terms and conditions of a customer agreement after the business has been awarded. Based on our prior experience, GE Betz, Inc is confident that we can negotiate mutually beneficial terms in a short period of time.

## Section 1 - Executive Summary

GE Water & Process Technologies is pleased to present this Water Treatment proposal to The West Virginia Department of Administration. With the most experienced field staff, state of the art production facilities and a world-class laboratory, GE is uniquely positioned to provide the chemicals, equipment, and expert services you require.

This document provides all commercial and technical details for the total solution proposed by GE Water & Process Technologies for the water treatment program requirements as per your bid request. Specific to this offer, several essential needs are addressed. These include selecting a vendor who can:

1. Control Corrosion of, deposition onto the metal portions of the cooling systems, and Biological growth in the cooling water systems.
2. Reduce total costs associated with closed systems, and boiler operations.
3. Provide accurate Legionella testing services for critical systems.
4. Provide leading and innovative technology to help day-to-day operations.

GE has designed a solution based on your unique technical requirements and general business objectives. The proposed GE design will allow you to meet your objectives by:

- Maintaining asset protection
- Reduce total cost of water
- Increase performance of the water systems
- Maintain Environmental compliance

Details on these items can be found throughout this proposal. Additionally, this document will discuss the Qualifications that uniquely position GE to deliver the complete water treatment program that allows ease of use, ease of maintenance, and consistent control.



## Section 2 - Commercial Offer

### Pricing Summary

Location	Monthly Cost	Yearly Cost
Bld.1 Main Capitol Bld.	\$52.50	\$630.00
Bld. 2 DMV Bld.	\$52.50	\$630.00
Bld. 4 112 California Ave.	\$52.50	\$630.00
Bld. 5 Highways	\$1,011.67	\$12,140.00
Bld. 6 Education	\$52.50	\$630.00
Bld. 8 Governor's Mansion	\$52.50	\$630.00
Bld. 11 Chilled Water Plant	\$52.50	\$630.00
Bld. 17 Finance (2101 Wash. St.)	\$52.50	\$630.00
Bld. 22 Tax & Revenue	\$52.50	\$630.00
Bld. 23 Beckley (407 Nevill St.)	\$52.50	\$630.00
Bld. 25 Parkersburg (5 <sup>th</sup> & Avery)	\$52.50	\$630.00
Bld. 36 One Davis Square	\$52.50	\$630.00
Bld. 37 DEP (Kanawha City)	\$787.50	\$9,450.00
Bld. 86 Greenbrooke (Smith St.)	\$129.67	\$1,556.00
Rehab Center (Institute, WV)	\$182.83	\$2,194.00
<b>Total Annual Standard</b>		<b>\$32,270.00</b>

Legionella Testing ( Based on price per test per facility)				
	# of Test	\$/Test	\$/Quarter	\$/Year
Bld. 4 (112 California Ave)	1	\$258	\$258	\$1,032
Bld. 5 Highways	1	\$258	\$258	\$1,032
Bld. 6 Education	1	\$258	\$258	\$1,032
Bld. 11 Chilled Water Plant	6	\$258	\$1,548	\$6,192
Bld. 17 Finance (2101 Wash. St.)	2	\$258	\$516	\$2,064
Bld. 22 Tax & Revenue	2	\$258	\$516	\$2,064
Bld. 23 Beckley (407 Nevill St.)	1	\$258	\$258	\$1,032
Bld. 25 Parkersburg (5 <sup>th</sup> & Avery)	2	\$258	\$516	\$2,064
Bld. 36 One Davis Square	3	\$258	\$774	\$3,096
Bld. 37 DEP (Kanawha City)	3	\$258	\$774	\$3,096
Bld. 86 Greenbrooke (Smith St.)	1	\$258	\$258	\$1,032
Rehab Center (Institute, WV)	4	\$258	\$1,032	\$4,128
<b>Total Annual Legionella</b>				<b>\$27,864</b>
<b>Total Bid</b>				<b>\$60,134.00</b>

## Section 3 - Transition Plan

Transitioning into the plant several steps will be taken:

- Assist in using up existing chemicals
- Start training process for operators at a mutually convenient schedule
- Start shipping in any necessary reagents and bulk tanks that may be needed
- Be on-site to help introduce new chemicals and feed rates.
- Back up service representative has been appointed, we can discuss as needed.

## Section 4 – Service Highlights

GE Water & Process Technologies is uniquely qualified to meet your needs. No other supplier can address all your comprehensive water treatment requirements in a strong combined offering. Through on site engineering and technical service representatives, we bring this level of expertise to you by offering a program that can include these services as part of our offering:

- **Professional Service** – Professional service reviewing key aspects of the water management program and delivering return on your investment with us
- **Woodlands Laboratory Access** – Use of the most advanced water laboratory in North America
- **Value Generation Plan** – Review of your Critical to Quality (CTQ) issues and assurance these are met
- **Field Force Mobile Computing** – Immediate access to water treatment knowledge and resources
- **Insight Monitoring Program** – 24/7 monitoring and control capability
- **Customer Portal** – Web based service site allowing you immediate access to critical data
- **Improved System Results** – Delivery of Proof, Not promises that our solution will improve system results and offer the best total return.
- **Legionella Testing** – This is a service that we offer on a requested basis utilizing an independent certified laboratory.

### GE Water & Process Technologies Cooling Service Description

Proper program monitoring is an essential part of any comprehensive cooling water system treatment program. Monitoring provides the feedback on program performance. It allows the performance of the program to be judged by methods other than the presence or absence of system component failures and/or reduced production.

It is essential that the good comprehensive on-site monitoring program in place is to evaluate program results and be as pro-active as possible in identifying and responding to any issues. A good monitoring program addresses the three critical parameters in a cooling system (corrosion, deposition, and microbiological (MB) activity), as well as, system /thermal performance. The typical on-site monitoring program for each parameter is described below and is customized to meet each customer's needs.

# GE Power & Water

## Water & Process Technologies

### **Corrosion**

The standard corrosion-monitoring program uses test strips (coupons) of each alloy in the actual system. These are pre-weighed and installed in a by-pass rack off the hot return header. They are normally exposed for a pre-determined period of time and then re-weighed and a corrosion rate calculated from weight loss. They can be inspected frequently during the exposure period so that corrosion problems can be identified more quickly. Corrosion coupons can also be installed locally at critical exchangers if the proper valving is available.

Routine water analyses also reveal potential corrosion problems. This may be exhibited somewhat directly, such as measurements of high iron or copper levels in the water; or it may be inferred from data such as pH, calcium and phosphate levels.

### **Deposition**

Corrosion coupons may also give some indications of deposit problems and again water chemistry may provide an indirect warning of potential system problems by looking at parameters such as delta phosphate (unfiltered - filtered), pH and saturation indices such as LSI (calcium carbonate), magnesium silicate and calcium-magnesium-silicate. However, the ultimate proof of system performance comes from actual exchanger monitoring. At your site we will work with you to identify the critical heat exchangers and implement a monitoring program for each.

These exchangers will be agreed upon with GE and customer personnel due to their critical nature and/or strenuous duty (importance to operation, economic impact, high heat load, low velocity, etc.). GE will monitor approach temperatures on the non-condensing exchangers and Cleanliness Factors on the condensing heat exchangers that have been identified as critical. GE will routinely track and report this data.

### **Cooling System Microbiological Activity**

Suspected MB activity is often first noticed by visual observations of the coupons or the process structure itself. However, this is merely a qualitative judgment. Quantitative data is needed for proper evaluation of the problem and a proper response.

Traditionally, microbial monitoring has been by sampling the bulk water (planktonic organisms) and then counting the population as colony forming units per milliliter. Several standard counting methods exist and simplifications of the methods have developed. The drawbacks to these methods are that they require an incubation period of between 48 and 72 hours; and they don't count all the bacterial species that may be present. This delays results and lengthens the time in which an appropriate response can be taken. GE Water & Process Technologies has had great results using a method that measure cellular ATP levels. By measuring ATP, we get a better picture

## GE Power & Water Water & Process Technologies

of the entire population and we get that result virtually instantaneously (within minutes). This greatly improves response time.

Still, measuring only planktonic organism is dangerous since it is actually the populations living on surfaces within the system (sessile organisms) that present the real problem. This population can be measured by cultivating MB on a stainless steel coupon in the corrosion by-pass rack and then counting the population using the ATP method. Samples from individual suspect exchangers may also be available by back flushing.

After all this, a potential problem can exist. Sulfate reducing bacteria are so dangerous, even at low populations, that methods specific to identifying those organisms must be used in addition to general counting or ATP methods.

### **Water Testing**

During service visits, our representative will obtain a routine collection of all system water as a quality control measure. Analyses will be performed and results reviewed with your operations team. Discrepancies with our established control parameters will be reviewed and corrective actions implemented and/or recommended.

### **Sampling Program**

On a regular basis, a complete set of water samples will be obtained and a report will be prepared for each system with results compared to historical trends.

### **Service Report/Review**

We agree that communication is key. At the conclusion of normal service or inspections, a report will be prepared detailing the testing and special projects conducted during the visit.

### **Laboratory Services**

GE total laboratory capabilities represent a multi-million dollar investment in equipment and personnel. These capabilities include water, inorganic/organic deposit, microbiological, metallurgical and resin analyses, and are all-available to support all GE treatment programs.

### **Metallurgical Services**

Our corporate metallurgical laboratory, located in our Woodlands Research Laboratory (Houston, TX), is capable of complete metallurgical evaluations of both boiler and cooling systems. In addition, we use the metallurgical laboratory as the principal method for chemical analyses of corrosion coupons and deposits on heat exchanger tubes which involves the use of a scanning electron microscope coupled to an energy dispersive x-ray analysis device (SEM-EDXA).

## Section 5 – GE Qualifications

### Company Overview

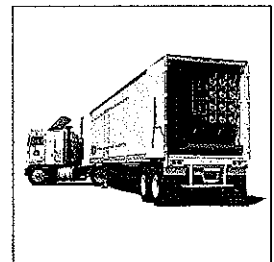
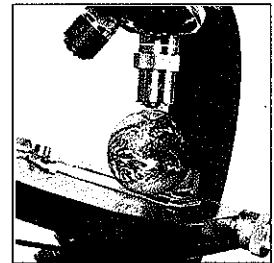
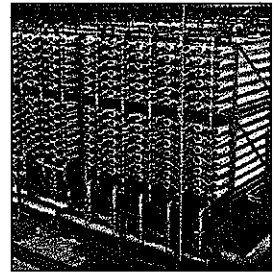
GE Water & Process Technologies is a leading global solutions provider of water, wastewater, desalination and process systems. GE delivers customer value by improving performance and product quality, by reducing operating costs and by extending equipment life. A broad range of products and services are used to optimize total water/process system performance, safeguard customer assets from corrosion, fouling and scaling, and protect the environment through water and energy conservation. With over 2500 field engineers bringing onsite expertise, we are able to deliver value by solving our customers' most challenging problems and improving the bottom line.

Headquartered in Trevose, Pennsylvania, GE Water & Process Technologies employs over 6500 people worldwide. Global Centers Of Excellence conduct leading edge research in our fields of expertise. Sites include Minnetonka, Minnesota, Watertown, Massachusetts, Norfolk, Virginia, The Woodlands, Texas, Guelph, Ontario, Mississauga, Ontario, Edmonton, Alberta, Heverlee, Belgium, San Paulo, Brazil and the GE Global Research Centers in Niskayuna, New York, Bangalore, India and Shanghai, China.

### Fields of Expertise

GE is unique in the industry, bringing a full array of products and service offerings to our customers. Our core competencies include:

- Water treatment chemicals and application engineering for raw and wastewater clarification, process water and industrial boiler and cooling water
- Process chemicals and additives for improved performance in refining, pulp & paper and metals processing applications
- Reverse Osmosis, Nanofiltration, Ultrafiltration and Microfiltration membrane systems for removing suspended and dissolved solids from fresh water, waste water and sea water
- Electrodeionization (EDI) for producing ultrapure water without chemical regenerants
- Mobile water treatment solutions for short-term and emergency use including deionization, filtration, Reverse Osmosis and EDI trailers in the industry's largest fleet
- Service agreements to Design, Build, Own, Operate and Maintain water treatment systems, allowing customers to focus their resources on their key operations



# GE Power & Water Water & Process Technologies

## **We don't just promise value. We Prove it.**

With GE, you know precisely how our water and process technologies help your bottom line. A Value Generation Plan quantifies how we enhance your key business results. To create a Value Generation Plan, we discuss your strategic objectives and suggest projects that can help you meet them. Then we monitor and manage all projects and report in detail how each one helped to:

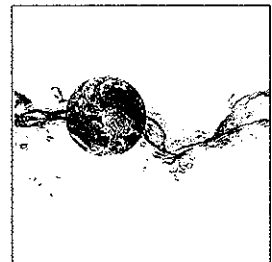
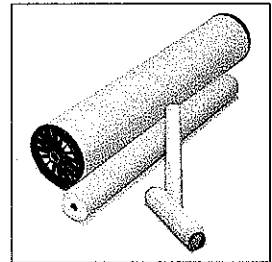
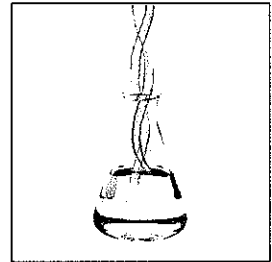
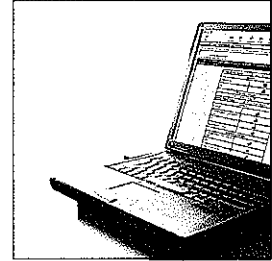
- Improve productivity
- Optimize critical equipment life and performance
- Increase process uptime
- Drive out costs
- Reduce waste
- Improve regulatory compliance
- Ensure performance through continuous monitoring and preventative diagnostics
- Preserve your capital and protect your cash flow with flexible financing

## **Global Leadership**

A comprehensive portfolio, innovative technology, application expertise and personal service are what made GE Water & Process Technologies a leader in water and process treatment. A passion for solving the world's most challenging water and process problems, being environmentally responsible and most importantly, **helping our customers win** guides our roadmap for the future.

Part of that future is ecomagination, an aggressive, long-term initiative from GE to bring to market new technologies that address the world's biggest environmental challenges. As part of ecomagination, GE pledges to double its investment in cleaner technologies, introduce more products that provide significant environmental performance advantages to customers, and offer more products and services that help customers meet their pure water and wastewater demands, reduce greenhouse gas emissions and improve efficiency. For more information on ecomagination, please visit our website:

<http://ge.ecomagination.com/>



GE Power & Water  
Water & Process Technologies

## Section 6 – Contract Page

This Water Treatment Proposal, subject to enclosed terms and conditions, is between State of West Virginia's spending unit hereafter referred to as "Customer", and GE Power & Water, Water & Process Technologies, the marketing name of GE Betz, Inc. and its affiliates, hereafter referred to as "GE" or "Contractor".

Accepted Date: \_\_\_\_\_

We, the Customer, acknowledge and accept the content and terms as outlined in the attached proposal.

GE will bill Customer in monthly installments for a period of twelve months. Please note that multi-year agreements shall be subject to the following escalation clause:

Beginning 1 year following the contract start date, price shall be adjusted by the greater of: (i) 2%; or (ii) a combination of two BLS indices in which 50% of the payment amount shall be adjusted by an amount equal to the percentage increase of the Index for Chemicals and Allied Products (WPU06) and 50% of the payment amount shall be adjusted by an amount equal to the percentage increase of the Index for Total Private Average Hourly Earnings of Production – Workers Not Seasonally Adjusted (CEU0500000008). Both indices are reported by the US Dept. Labor Statistics - monthly for PPI & quarterly for CEU.

Customer purchase order number: \_\_\_\_\_  
(Hard copy to be attached, made out to GE Betz, Inc., 4636 Somerton Road, Trevose, PA 19053. Please reference the proposal number of the cover page of this document.)

**Customer**

Name: \_\_\_\_\_

Signature: \_\_\_\_\_

Title: \_\_\_\_\_

**GE Betz, Inc.**

Name: \_\_\_\_\_

Signature: \_\_\_\_\_

Title: \_\_\_\_\_



## Section 7 – Terms and Conditions

1. **Exclusive Terms and Conditions.** Together with any other terms the parties agree to in writing, these Terms and Conditions of Sale form the exclusive terms ("Agreement") whereby Buyer agrees to purchase, and Seller agrees to sell Goods and provide advice, instruction and other services in connection with the sale of those Goods ("Services"). Notwithstanding any provisions communicated in any way by Buyer to Seller prior to this Agreement including any terms contained in any request for quote by Buyer, Buyer agrees that this Agreement will control the relationship by accepting Goods and Services from Seller, even if Buyer sends to Seller other terms and conditions to which Seller may not respond.

2. **Buyer Obligations.** Seller will not control the actual operation of either Buyer's systems or Goods at the site, and unless otherwise specifically agreed in writing, installation of Goods shall be the responsibility of Buyer. Goods and Services provided hereunder are based upon the information Buyer makes available to Seller, and Seller reserves the right to utilize the most compact and feasible design compatible with sound engineering practices, and to make changes in details of design, construction and arrangement of Goods unless precluded by limitations (including, but not limited to actual space and feedwater/substance quality specifications) specified by Buyer in writing at the time an order is placed. If no such limitations are specified, Seller shall not be held responsible for incompatibility of the Goods and Services due to changes in feedwater/substance quality specifications or site conditions nor for incompatibility with actual space or design limitations, which were not initially disclosed by Buyer and become apparent at a later date. For Services to be accurate and Goods to work as intended, Buyer must fulfill the following obligations ("Obligations"): (a) provide Seller complete and accurate information and data relevant to the scope of work to be provided, such as information related to Buyer's site conditions, systems, related equipment and processes, feedwater or other substances to be treated or measured with the Goods, including any hidden, unapparent, or changing conditions that may affect the effectiveness of the Goods; (b) operate all related systems and the Goods within the agreed to control parameters or, if none, within industry customary operating conditions; (c) maintain all related systems and Goods in good operating condition and repair; and (d) maintain and handle Goods in a proper and safe manner. If Buyer fails to fulfill the foregoing Obligations, Seller shall be relieved of any obligations with respect to warranties or any other commitments made to Buyer in writing, and Seller shall have no liability for any loss, damage or injury which Buyer may sustain or for which Buyer may be liable. Buyer is solely responsible for the operation of Buyer's systems, including ensuring that the systems are operated and maintained properly and comply with all laws, rules, regulations, license conditions and orders. Seller will not operate, inspect or maintain Buyer's systems or act as a licensed operator as defined by local regulatory authorities. Buyer shall not sell or permit the use of the Goods in connection with any nuclear installation or activity without the prior written consent of the Seller. Seller shall have no liability whatsoever for any nuclear or other damage, injury or contamination arising in connection with any such sale or use.

3. **Delivery.** Title and risk of loss or damage to Goods as well as containers and tanks in which Goods are contained, except as provided for in Section 8 of this Agreement, shall pass to Buyer upon delivery to carrier at designated shipping point. Delivery dates indicated by Seller are only approximations. Quotations and proposal drawings provided by Seller show only general style, arrangement and approximate dimensions and weight.

4. **Payment and Prices.** Unless otherwise specified in writing, payment is due not thirty (30) days from the date of Seller's invoice. If Seller shall have any doubt as to Buyer's ability to pay, Seller may decline to make deliveries except on receipt of satisfactory security. The prices quoted herein do not include taxes. Buyer shall be directly responsible, and reimburse Seller, for the gross amount of any present or future sales, use, excise, value-added, or other similar tax applicable to the price, sale of delivery of any products or services furnished hereunder. Buyer shall furnish Seller with evidence of exemption acceptable to the taxing authorities if applicable. For multi-year agreements, pricing stated shall remain firm for 12 months, after which Seller shall be entitled to adjust pricing upward on an annual basis according to the designated formula used by Seller in Buyer's country and which shall be notified to Buyer. Unless otherwise specified, all prices are FOB point of shipment. Buyer agrees to reimburse Seller for collection costs, including 2% interest per month, should Buyer fail to timely pay. Buyer shall have no rights to any setoffs of any nature relating to any payments due under the Agreement. Notwithstanding the terms set forth herein or of any agreement or acceptance of Seller's quotation, Seller reserves the right at any time and from time to time by notice in writing to the Buyer to (a) increase Prices for impose temporary price adjustments based on increases in the cost of base components for the Goods or Services provided, where the increase is due to increased global demand, limited supply, temporary product shortages, allocation of supply, or such other similar inflationary pressures; and (b) impose a surcharge equal to any increase in the cost of the Goods or Services as a result of a modification of exchange rates, taxes or other levies imposed by public authorities.

5. **Payment for Excessive Usage, Lost and Damaged Goods.** If payment for Goods is based on some factor other than the actual amount of Goods delivered (e.g., payment is for a fixed amount, or based on usage or production), then Buyer agrees to pay for all Goods (a) consumed as a result of Buyer's failure to comply with Obligations as set forth in Section 2; or (b) lost or damaged after delivery to Buyer. Buyer shall provide Seller all information necessary to calculate amounts due and enable Seller to audit those records.

6. **Consigned Goods.** Buyer shall bear all risk of loss and damage to all consigned Goods in Buyer's possession or control, notwithstanding Buyer's exercise of reasonable care. Seller shall have the right to enter Buyer's premises at all reasonable times to inspect such Goods and related records. Upon request, Buyer agrees to return such Goods to Seller pursuant to Seller's shipping instructions.

7. **Limited Warranties.** Seller warrants that the Goods shall conform to published specifications and shall be free from defects in material and workmanship when at all times operated in accordance with Seller's written instructions; and that the Services will be performed with the degree of skill which can reasonably be expected from a seller engaged in a comparable business and providing comparable services under comparable circumstances. Under no circumstances do Services include the operation, inspection or maintenance of Buyer's systems or acting as a licensed operator as defined by local regulatory authorities.

8. **Unless otherwise provided in any Warranty Schedule that may be attached hereto, the foregoing warranties are valid: (a) for Chemicals, the earlier of, the shelf-life of the product, or 6 months from their date of delivery or the provision of Services; (b) for Consumables, including Filters and Membranes, 12 months from their date of delivery, (c) for Goods other than Chemicals and Consumables, the earlier of, 15 months from receipt, or 12 months from start-up/first use; (d) for Software, 9 months from the date of receipt. Unless expressly agreed in a "Performance Warranty Document" signed between the parties on a separate basis, there is no performance warranty on Goods and Services or warranty on process results. For Goods not manufactured by Seller, the warranty shall be the manufacturer's transferable warranty only. Any claim for breach of these warranties must be promptly notified in writing or the claim will be void. Seller's sole responsibility and Buyer's exclusive remedy arising out of or relating to the Goods or Services or any breach of these warranties is limited to, at Seller's option: (a) replacement of non-conforming Goods or refund of purchase price of the non-conforming Goods; and (b) re-performance of the Services at issue, or a refund of the amount paid for the Services at issue. No allowance will be made for repairs or alterations made by Buyer without Seller's written consent or approval. Goods may not be returned to Seller without Seller's written permission. Seller will provide Buyer with a "Return Material Order" number to use for returned goods. Buyer, as the original purchaser, is not entitled to extend or transfer this warranty to any other party. The foregoing warranties are in lieu of and exclude all other warranties, statutory, express or implied, including any warranty of merchantability or of fitness for a particular purpose.**

9. **Use of Equipment, Tanks, and Containers.** Semi-bulk containers (SBCs) owned by Seller shall be used only for the storage of Goods approved by Seller and Buyer shall return to Seller all SBCs owned by the Seller in an "empty" condition, as defined by appropriate transport or environmental regulations. Title to, and risk and ownership of, all equipment, product containers (e.g., pails, drums, recyclable intermediate bulk containers "IBC"), and tanks supplied to Buyer shall pass to Buyer as provided for in Section 3 of this Agreement, except that returnable SBCs shall remain property of Seller, unless otherwise stated in Seller's documentation.

10. **Compliance with Laws; Permits.** Buyer is responsible for compliance with all laws and regulations applicable to the operation of its systems and to the storage, use, handling, installation, maintenance, removal, registration and labeling of all Goods from and after Buyer's receipt of the Goods, as well as for the proper management and disposal of all wastes

and residues associated with the Goods (including but not limited to containers, excess or off-spec product, testing wastes (e.g., spent or expired lab reagents and test kits) and signing manifests for waste transport and disposal. Buyer agrees to ensure that all Goods and Services provided to Buyer for export are exported only in compliance with applicable export control laws and regulations. Permits and licenses which are required to operate apparatus or equipment or to use the Goods, shall be procured by Buyer at Buyer's sole expense. Buyer shall be responsible for and procure all permits, licenses, exemptions, authorizations and approvals necessary to the operation of its systems, including but not limited to permits related to liquid and solid waste handling and discharge, air and water emissions, sound, safety, etc. Seller shall not be liable if any such permit, license, exemption, authorization or approval is delayed, denied, revoked, restricted, violated or not renewed and Buyer shall not be relieved thereby of its obligations to pay Seller in accordance with this Agreement. The sale of Goods and Services is subject to compliance with all applicable laws, including trade control laws. This requirement survives the expiry or termination of this Agreement. Buyer agrees that any export, re-export, diversion, or trans-shipment of the Goods (including software and technical data) to any entity or destination other than provided for in this Agreement will be in accordance with all applicable laws.

11. **Force Majeure.** Neither party will be responsible to the other (and no event of default will be deemed to have occurred) if uncontrollable events make it impracticable or commercially unreasonable for either party to perform under the terms of this Agreement, provided no force majeure shall apply to Buyer's obligation to pay in a timely manner for Goods and Services. Scheduled delivery dates are subject to extension when a force majeure event occurs.

12. **Confidentiality and Intellectual Property.** Both parties agree to keep confidential the other party's proprietary non-public information, if any, which may be acquired in connection with this Agreement. Buyer will not, without Seller's advance written consent, subject Goods to testing, analysis, or any type of reverse engineering. Seller retains all intellectual property rights including copyright which it has in all drawings and data or other deliverables supplied or developed under this Agreement, subject to Buyer's right to use such drawings and data for its own use without additional cost. Buyer acknowledges that Seller is in the business of selling the Goods subject to this Agreement and agrees that it will not file patent applications on the Goods, or processes and methods of using the Goods, without Seller's express written permission. Buyer further agrees that in any event any such patents will not be asserted against Seller or its customers based upon purchase and use of such Goods. Buyer shall be fully liable for any infringement of patent rights of third parties arising out of the products supplied hereunder where the construction, and other characteristics of such products including modification of the Goods and Services, is prescribed to the Seller, or completed independently, by the Buyer or agent(s). Buyer shall fully defend and indemnify the Seller in case of such claim(s). Any software Seller owns and provides pursuant to this Agreement shall remain Seller's property. Seller provides to Buyer a limited, non-exclusive and terminable license to use the object code of such software for the term of this Agreement. Buyer agrees not to export, copy (except that Buyer may make one copy for backup purposes), sub-license, translate, transfer, reverse engineer, or decode the software. Single user versions of software may be used on one CPU, LAN/WAN versions may be used on a single server with only the number of concurrent users as agreed to by the parties. Unless otherwise expressly agreed by Seller, this license shall terminate and the software shall be returned to Seller upon termination of this Agreement, or the material breach of the terms in this section. Buyer shall defend and indemnify Seller in respect of any claim or liability suffered by Seller in connection with infringement of any third party rights based on design, specifications or requirements prescribed by Buyer or its agent.

13. **Limitation on Liability.** Except where expressly communicated to Seller, Seller shall have no liability for incompatibility of Goods with Buyer's actual space or design limitations. To the extent permitted by law, the total liability of the Seller for all claims arising out of or relating to the performance or breach of this Agreement or use of any Goods or Services shall not exceed the annual contract value of this Agreement. Seller shall not be liable for any advice, instruction, assistance or any services that are not required under this Agreement or for which Seller does not charge Buyer. In no event will either party be liable to the other for lost profits or revenues, cost of capital or replacement or increased operating costs, lost or decreased production, claims of Buyer's customers for such damages or any similar or comparable damages, or for any incidental, special, consequential or indirect damages of any type or kind, irrespective of whether arising from actual or alleged breach of warranty, indemnification, product liability or strict liability, or any other legal theory, if Buyer is supplying, or otherwise making available, Seller's Goods or Services to a third party. Buyer agrees to protect, defend, indemnify and hold Seller, its corporate affiliates, and their respective officers, directors, employees and agents, free and harmless from and against any and all liability, claims, demands, causes of action, suits or other litigation, arising out of or related to Seller's Goods or Services provided by the Buyer to a third party, including but not limited to products or services that may be related to Seller's Goods or Services.

14. **Conflicts; Survival; Assignment; No Third Party Beneficiary Rights.** If there is any conflict between this Agreement and any written proposal or quotation provided by Seller, then the terms and conditions set forth in the proposal or quotation shall prevail. If any term or condition of this Agreement or any accompanying terms and conditions are held invalid or illegal, then such terms and conditions shall be reformed to be made legal or valid, or deleted, but the remaining terms and conditions shall remain in full force and effect, and the Agreement shall be interpreted and implemented in a manner which best fulfills our intended agreement. None of the parties hereto may assign its rights or delegate its obligations under this Agreement without the written consent of the other party hereto. This Agreement and all of the provisions hereof shall be binding upon and inure only to the benefit of the parties hereto and their respective successors and permitted assigns, and no other party, including any employee or creditor of any party hereto or any affiliate thereof, shall have any rights or obligations hereunder.

15. **Termination and Cancellation.** This Agreement and any performance pursuant to it may be terminated or suspended by either party if the other party (a) is the subject of bankruptcy or insolvency proceedings; or (b) defaults in its material obligations under this Agreement, and such default is not cured within thirty (30) days. Upon the termination of this Agreement: (a) Buyer agrees to pay for all Goods in Buyer's possession or for which title has passed to Buyer, at current prices or at such other prices as have been agreed to in writing; and (b) all amounts owing, if any, for the equipment or tanks relating to those Goods shall immediately become due and shall be paid within thirty (30) days of receipt of an invoice. In the event of cancellation of an order by Buyer, a cancellation charge will be made against the Buyer, in proportion to the work completed by Seller, or obligated against the order, plus any cancellation charges assessed against Seller by Seller's suppliers.

16. **Governing Law and Dispute Resolution.** This Agreement shall be governed by the substantive laws of the State of New York. The UN Convention on the International Sale of Goods shall not apply. In the event of a dispute concerning this Agreement, the complaining party shall notify the other party in writing thereof. Management level representatives of both parties shall meet at an agreed location to attempt to resolve the dispute in good faith. Should the dispute not be resolved within thirty (30) days after such notice, the complaining party shall seek remedies exclusively through arbitration. The seat of arbitration shall be the federal district court in Philadelphia, PA, and the rules of the arbitration will be the Commercial Arbitration Rules of the American Arbitration Association, which are incorporated by reference into this clause.

17. **Miscellaneous.** No modification, amendment, revision, waiver, or other change shall be binding on either Party unless agreed in writing by the Party's authorized representative. Any oral or written representation, warranty, course of dealing, or trade usage not specified herein shall not be binding on either Party. Each Party agrees that it has not relied on, or been induced by, any representations of the other Party not contained in this Agreement.

# GE Power & Water Water & Process Technologies

## Appendices

### Experience and Expertise:

#### Project #1: Water and Energy Savings

- Customer is general manufacturing, aluminum industry
- Contact information: Novelis Corporation, William Davis 304-367-5161
- GE Power and Water treats their cooling water similar in size and treatment to our proposed package.
  - Project was involved with increasing cooling tower cycles of concentration utilizing new chemical technology exclusive to GE and saving the customer over \$44,000.

#### Project #2: Water Savings

- Customer is similar in size and treatment program to the proposed package
- Contact information: Air Products, Jesse Park 724-226-4427
- Manufacture air separation
  - Project was involved with increasing cooling tower cycles of concentration and eliminating acid feed for a safer working environment which led to savings of \$16,500 in water and acid costs.

#### Project #3: Evaporation Credits

- Customer is a hospital similar in size to WV Dept. of Administration Facilities
- Contact information: Meadville Medical Center, Tom Darcangelo 814-333-5116.
  - Project was to help achieve evaporation credits to reduce water usage costs.

#### Attachment 1:

- Product fact Sheets

#### Attachment 2:

- MSDS

#### Legionella Testing Agreement

# CorrShield\* NT4200

## Closed System Cooling Water Treatment

- Effective on steel, copper and mixed metallurgy systems
- Additional aluminum corrosion protection
- Stable and effective at high temperature and heat fluxes
- Compatible with glycol and alcohol antifreeze solutions
- Buffered for pH control
- Contains red dye for leak detection

### Description and Use

CorrShield NT4200 is a specially formulated ni-trite-based scale and corrosion inhibitor designed for use in closed systems containing steel, iron, yellow metals and/or aluminum. It is effective in controlling corrosion over a wide range of conditions. CorrShield NT4200 has been successfully applied in systems using demineralized, softened or hard water makeup. Recommended for diesel and other internal combustion engines, hot water heating systems, chilled water circuits and other closed systems containing ferrous and non-ferrous metals. Application of CorrShield NT4200 in engine jacket cooling waters precludes the necessity for pre-softening or demineralizing these waters.

### Treatment And Feeding Requirements

Typically the closed cooling water should be maintained at a high pH with this inhibitor. Proper treatment levels for CorrShield NT4200 depend on several factors such as the corrosion potential and conditions particular to a given installation. The product should be used in accordance with control

procedures that GE establishes for a specific application.

Internal Combustion Engines: premixed solution of CorrShield NT4200 and makeup water are desirable to assure adequate treatment level in the jacket water. CorrShield NT4200 may be added directly, as received, to the engine cooling system. Your GE representative will advise optimum dosages, based on system requirements.

### General Properties

Physical properties of CorrShield NT4200 are shown on the Material Safety Data Sheet, a copy of which is available upon request.

### Packaging Information

CorrShield NT4200 is a liquid blend available in a wide variety of customized containers and delivery methods. Contact your GE representative for details.

### Storage

Protect from freezing. If this product is frozen during shipment or storage, slight mixing may be required to ensure homogeneity.

### Safety Precautions

A Material Safety Data Sheet containing detailed information about this product is available upon request.



Find a contact near you by  
visiting [ge.com/water](http://ge.com/water) or  
e-mailing [custhelp@ge.com](mailto:custhelp@ge.com).

**Global Headquarters**  
Trevose, PA  
+1-215-355-3300

**Americas**  
Watertown, MA  
+1-617-926-2500

**Europe/Middle East/Africa**  
Heverlee, Belgium  
+32-16-40-20-00

**Asia/Pacific**  
Shanghai, China  
+86 (0) 411-8366-6489

©2007, General Electric Company. All rights reserved.

\*Trademark of General Electric Company; may be registered in one or more countries.

ptc737en Oct-07

# Spectrus™ NX114

## Microbiological Control Agent

- Controls a broad spectrum of microbiological species in cooling water
- Patented blend minimizes microbial resistance
- Non-foaming
- Compatible with all corrosion and deposit control treatment
- Synergistic with halogen-based disinfectants
- Contain no copper or iron stabilizers
- Approved for sale in California<sup>1</sup>

### Description and Use

Spectrus NX114 is a proprietary blend of antimicrobial agents, specifically formulated for cooling water applications. It may be used in open recirculating cooling water systems or closed water loops. Spectrus NX114 is registered for control of a wide range of microbial species, including aerobic bacteria, anaerobic bacteria, algae, yeast, and fungal populations.

#### <sup>1</sup>NOTE TO CALIFORNIA USERS -

At the present time, the State of California has approved this product for use in recirculating cooling systems (evaporative condensers, heat exchange water systems, commercial and industrial cooling towers) and brewery pasteurizers, only. Consult the California version of the Spectrus NX1100 product label for a complete listing of approved end-uses and recommended dosages.

Control of microbiological populations in cooling systems is essential to maintain heat transfer efficiency in heat exchange equipment and the cooling tower. If control is not achieved, loss of heat transfer efficiency leads to lost production, unscheduled shutdowns, and extended turnarounds. If not controlled, microbiologically induced corrosion (MIC)

results in lost profits caused by under-deposit corrosion.

Spectrus NX114 is compatible with chlorine and bromine disinfection programs and actually demonstrates improved efficacy in the presence of these oxidizing agents. This means that continuous halogenation does not have to be interrupted or suspended when Spectrus NX114 is fed into a cooling system. This is especially important when microbiological populations flourish due to organic contamination.

Spectrus NX114 is water-based to minimize impact on the environment. It contains no metal-based stabilizers, such as copper or iron, thus simplifying customer compliance with NPDES limits. The Environmental Fate (aquatic toxicity and biodegradation) and Effects data package for this product is listed in Section 12 of the Material Safety Data Sheet.

### Treatment and Feeding Requirements

Correct treatment levels and frequency of Spectrus NX114 addition depend on many factors. They include, but are not limited to, system cleanliness, nutrient concentrations, temperature, types of microorganisms, system operating characteristics, and retention time. Microbiological monitoring is recommended to evaluate product requirements. Consult your GE representative for technical advice on your specific application.

### General Properties

Physical properties of Spectrus NX114 are shown on the Material Safety Data Sheet, a copy of which is available on request.



Visit us online at [www.gewater.com](http://www.gewater.com)  
©2004, General Electric Company.  
All rights reserved.

**Global Headquarters**  
Trevose, PA  
215-355-3300

**Americas**  
Minnetonka, MN  
952-933-2277

**Europe/Middle East/Africa**  
Heverlee, Belgium  
32-16-40-20-00

**Asia/Pacific**  
Shanghai, China  
86-21-5298-4573

Products mentioned are trademarks of the General Electric Company and may be registered in one or more countries.

PFC601EN 0410

## **Packaging Information**

Spectrus NX114 is a liquid blend available in a wide variety of customized containers and delivery methods. Contact your GE representative for details.

## **Storage Information**

Protect from freezing. If this product is frozen during shipment or storage, slight mixing may be required to ensure homogeneity.

## **Safety Precautions**

A Material Safety Data Sheet containing detailed information about this product is available upon request.

# CorTrol™ IS104

## Oxygen Scavenger

- Controls oxygen corrosion in the feedwater systems and the boiler
- Easily applied liquid concentrate
- Alkaline formulation will not cause feedwater or boiler pH depression
- Available with drum-free liquid deliveries through the GE Infrastructure Water & Process Technologies Custom Distribution Service™ (CDSTM)

### Description and Use

CorTrol™ IS104 is a concentrated, alkaline, liquid sulfite product which is designed to control oxygen corrosion in boilers and closed hot water systems.

Dissolved oxygen is a constant threat to the integrity of a feedwater system, an economizer, and internal boiler and condensate system surfaces. Even minor concentrations of dissolved oxygen can cause severe pitting corrosion. Because of its highly localized nature, pitting attack, caused by dissolved oxygen, can result in rapid failure of feedwater lines, economizers, boiler tubes, and condensate return lines.

CorTrol IS104 controls corrosion by reacting with and removing any dissolved oxygen present in the feedwater or boiler water. In addition, it creates a reducing environment in the boiler that promotes the formation of a protective iron oxide film.

CorTrol IS104 may also be used to control oxygen corrosion in closed hot water systems where an oxygen scavenger program is indicated.

### Treatment and Feeding Requirements

CorTrol IS104 may be fed neat or diluted with deaerated feedwater or condensate to a convenient strength. Dilute feed solutions ("day tanks") of this product should be made down on a daily basis to avoid excessive depletion of product actives through

atmospheric contact. The feed solutions can be further protected by fitting day tanks with a plastic floating lid" or adding a layer of hollow, floating polyethylene, polypropylene, or PVC balls to minimize contact with the atmosphere.

Chemical feed injection quills must be constructed of stainless steel or another resistant alloy.

The preferred feed points for CorTrol IS104 are to the storage section of the deaerating heater below the waterline, to the feedwater line, or to the hotwell or feedwater tank.

### General Properties

Physical properties of CorTrol IS104 are shown on the Material Safety Data Sheet, a copy of which is available on request.

### Packaging Information

CorTrol IS104 is a liquid blend, available in a wide variety of customized containers and delivery methods. Contact your GE representative for details.

### Storage

Store CorTrol IS104 at moderate temperatures and protect from freezing. If frozen, thaw completely and mix thoroughly prior to use. Exposure to atmospheric oxygen should be minimized.

### Safety Precautions

A Material Safety Data Sheet containing detailed information about this product is available upon request.



Visit us online at [www.gewater.com](http://www.gewater.com)  
©2004, General Electric Company.  
All rights reserved.

**Global Headquarters**  
Trevose, PA  
215-355-3300

**North America**  
Minnetonka, MN  
952-933-2277

**Europe/Middle East/Africa**  
Heverlee, Belgium  
32-16-40-20-00

**Asia/Pacific**  
Shanghai, China  
86-21-5298-4573

Products mentioned are trademarks of the General Electric Company and may be registered in one or more countries.

PEB104EN 0410

# OptiSpense\* AP302

## Internal Treatment

- Applicable as an All-polymer internal treatment
- Superior control of hardness and iron deposition
- Improves boiler efficiency by maintaining cleaner heat transfer surfaces
- PolyTrack\* tracer provides easy and accurate determination of product levels

## Description and Use

OptiSpense AP302 is an aqueous blend of a polymeric dispersant and an easily testable product tracer. It is designed for application as an "All-polymer" treatment to prevent the formation of scale deposits on internal boiler surfaces.

OptiSpense AP302 controls deposit formation through two surface adsorption mechanisms: Dispersion and Crystal Modification.

**Dispersion:** The OptiSpense AP302 polymer adsorbs strongly to deposit particles, altering their normal surface charge properties. The attraction between particles and internal boiler surfaces is greatly reduced. This inhibits both particle growth and attachment to surfaces. The result is a stabilized suspension of colloidal particles readily removed through blowdown.

**Crystal Modification:** The OptiSpense AP302 polymer distorts the normal crystalline structure of deposit particles, so that normal growth is prevented. This avoids the formation of large, unstable particles that settle onto boiler surfaces.

OptiSpense AP302 promotes maximum boiler efficiency by preventing the formation of both hardness and metal oxide deposits on boiler heat transfer surfaces.

## Treatment and Feeding Requirements

Proper treatment levels for OptiSpense AP302 depend on many factors particular to a given boiler system. The product should be used in accordance with control procedures that GE Infrastructure Water & Process Technologies establishes for a specific application.

OptiSpense AP302 may be fed neat, or diluted to any convenient strength with softened makeup, condensate, or feedwater.

## Packaging Information

OptiSpense AP302 is a liquid blend, available in a wide variety of customized containers and delivery methods. Contact your GE representative for details.

## Storage

Store OptiSpense AP302 at moderate temperatures and protect from freezing. If frozen, thaw completely and mix thoroughly prior to use.

## Safety Precautions

A Material Safety Data Sheet containing detailed information about this product is available upon request.



Visit us online at [www.gewater.com](http://www.gewater.com)  
©2005, General Electric Company.  
All rights reserved.

**Global Headquarters**  
Trevose, PA  
+1-215-355-3300

**Americas**  
Minnetonka, MN  
+1-952-933-2277

**Europe/Middle East/Africa**  
Heverlee, Belgium  
+32-16-40-20-00

**Asia/Pacific**  
Shanghai, China  
+86-21-5298-4573

\*Trademark of General Electric Company; may be registered in one or more countries.

PFB118EN 0503

# Steamate\* NA1321

## Condensate Treatment

- Controls corrosion of equipment and piping
- Minimizes deposition of corrosion products in boiler systems

### Description and Use

Steamate\* NA1321 is a neutralizing amine which volatilizes with the steam. It is designed to quickly neutralize the acidic components of steam and minimize the aggressiveness of unbuffered condensate. This reduces the pickup of copper and iron corrosion products.

### Technology

Corrosion in steam condensate systems is frequently a problem. Carbon dioxide is by far the most common cause of corrosion.

The feedwater alkalinity is the chief source of carbon dioxide because bicarbonate and carbonate break down at elevated temperatures to form carbon dioxide gas. The reactions are as follows:

1.  $2\text{NaHCO}_3 + \text{heat} \rightarrow \text{Na}_2\text{CO}_3 + \text{CO}_2 + \text{H}_2\text{O}$   
bicarbonate + heat  $\rightarrow$  carbonate + carbon dioxide + water
2.  $\text{Na}_2\text{CO}_3 + \text{H}_2\text{O} + \text{heat} \rightarrow 2\text{NaOH} + \text{CO}_2$   
carbonate + water + heat  $\rightarrow$  hydroxide + carbon dioxide

At points of condensation, carbon dioxide dissolves in the water to form carbonic acid. This depresses the pH and causes etching of the metal. The characteristic acidic corrosion shows up as thinning and grooving of the metal at and below the water level.

### Treatment and Feeding Requirements

Proper treatment levels for Steamate NA1321 depend on many factors particular to a given installation. Although the condensate pH is usually maintained in a noncorrosive alkaline range, the product should be used in accordance with control procedures that GE Water & Process Technologies establishes for a specific application.

Steamate NA1321 should be mixed with softened makeup, condensate, or feedwater to make a chemical feed solution of any convenient strength. The product is also compatible with most boiler water treatment formulations. When mixed with other boiler treatments, the combined strength should not exceed ten percent by weight.

### Packaging Information

Steamate NA1321 is a liquid blend, available in a wide variety of customized containers and delivery methods. Contact your GE representative for details.

### Safety Precautions

A Material Safety Data Sheet containing detailed information about this product is available upon request.







# Material Safety Data Sheet

Issue Date: 26-MAY-2006  
Supercedes: 26-MAY-2006

CORRSHIELD NT4200

---

## 1 Identification of Product and Company

**Identification of substance or preparation**  
CORRSHIELD NT4200

**Product Application Area**  
Water-based corrosion inhibitor.

**Company/Undertaking Identification**  
GE Betz, Inc.  
4636 Somerton Road  
Trevose, PA 19053  
T 215 355-3300, F 215 953 5524

**Emergency Telephone**  
(800) 877-1940

Prepared by Product Stewardship Group: 215 355-3300

## 2 Composition / Information On Ingredients

Information for specific product ingredients as required by the U.S. OSHA HAZARD COMMUNICATION STANDARD is listed. Refer to additional sections of this MSDS for our assessment of the potential hazards of this formulation.

**HAZARDOUS INGREDIENTS:**

Cas#	Chemical Name	Range (w/w%)
7632-00-0	SODIUM NITRITE Oxidizer; toxic (by ingestion); potential blood toxin	10-20
7631-99-4	SODIUM NITRATE Oxidizer; potential blood toxin	7-13
12179-04-3	BORIC ACID, DISODIUM SALT, PENTAHYDRATE Irritant (abraded skin); slight irritant (respiratory)	5-10
6834-92-0	SODIUM METASILICATE, PENTAHYDRATE Corrosive (eyes, skin, and respiratory); potential kidney toxin	5-10
1310-73-2	SODIUM HYDROXIDE (CAUSTIC SODA) Corrosive; toxic (by ingestion)	1-5

## 3 Hazards Identification

\*\*\*\*\*

**EMERGENCY OVERVIEW**

**WARNING**

May cause slight irritation to the skin. Severe irritant to the eyes. Mists/aerosols may cause irritation to upper respiratory tract.

DOT hazard: Corrosive to aluminum, RQ  
Odor: Slight; Appearance: Red-Purple, Liquid

Fire fighters should wear positive pressure self-contained breathing apparatus(full face-piece type). Proper fire-extinguishing media: Flood with water. Use of CO2 or foam may not be effective.

\*\*\*\*\*

**POTENTIAL HEALTH EFFECTS**

**ACUTE SKIN EFFECTS:**

Primary route of exposure; May cause slight irritation to the skin.

**ACUTE EYE EFFECTS:**

Severe irritant to the eyes.

**ACUTE RESPIRATORY EFFECTS:**

Mists/aerosols may cause irritation to upper respiratory tract.

**INGESTION EFFECTS:**

May cause gastrointestinal irritation.

**TARGET ORGANS:**

Prolonged or repeated exposures may cause CNS depression and/or toxicity to the kidney and blood.

**MEDICAL CONDITIONS AGGRAVATED:**

Not known.

**SYMPTOMS OF EXPOSURE:**

May cause redness or itching of skin, irritation, and/or tearing of eyes (direct contact).

**4 First Aid Measures**

**SKIN CONTACT:**

Remove contaminated clothing. Wash exposed area with a large quantity of soap solution or water for 15 minutes.

**EYE CONTACT:**

Immediately flush eyes with water for 15 minutes. Immediately contact a physician for additional treatment.

**INHALATION:**

Remove victim from contaminated area to fresh air. Apply appropriate first aid treatment as necessary.

**INGESTION:**

Do not feed anything by mouth to an unconscious or convulsive victim. Do not induce vomiting. Immediately contact physician. Dilute contents of stomach using 3-4 glasses milk or water.

**NOTES TO PHYSICIANS:**

No special instructions

**5 Fire Fighting Measures**

**FIRE FIGHTING INSTRUCTIONS:**

Fire fighters should wear positive pressure self-contained breathing apparatus (full face-piece type).

**EXTINGUISHING MEDIA:**

Flood with water. Use of CO2 or foam may not be effective.

**HAZARDOUS DECOMPOSITION PRODUCTS:**

elemental oxides

**FLASH POINT:**

> 200F > 93C P-M(CC)

**MISCELLANEOUS:**

Corrosive to aluminum, RQ

UN 3266;Emergency Response Guide #154

## 6 Accidental Release Measures

**PROTECTION AND SPILL CONTAINMENT:**

Ventilate area. Use specified protective equipment. Contain and absorb on absorbent material. Place in waste disposal container.

Flush area with water. Wet area may be slippery. Spread sand/grit.

**DISPOSAL INSTRUCTIONS:**

Water contaminated with this product may be sent to a sanitary sewer treatment facility, in accordance with any local agreement, a permitted waste treatment facility or discharged under a permit. Product as is - Incinerate or land dispose in an approved landfill.

## 7 Handling & Storage

**HANDLING:**

Contains an oxidizer. Avoid all contact with reducing agents, oils, greases, organics and acids. Do not allow to dry.

**STORAGE:**

Keep containers closed when not in use. Protect from freezing. Do not store near strong acids. Use proper containers.

## 8 Exposure Controls / Personal Protection

**EXPOSURE LIMITS****CHEMICAL NAME****SODIUM NITRITE**

PEL (OSHA): NOT DETERMINED

TLV (ACGIH): NOT DETERMINED

**SODIUM NITRATE**

PEL (OSHA): NOT DETERMINED

TLV (ACGIH): NOT DETERMINED

**BORIC ACID, DISODIUM SALT, PENTAHYDRATE**

PEL (OSHA): NOT DETERMINED

TLV (ACGIH): 1 MG/M3

**SODIUM METASILICATE, PENTAHYDRATE**

PEL (OSHA): NOT DETERMINED

TLV (ACGIH): NOT DETERMINED

**SODIUM HYDROXIDE (CAUSTIC SODA)**

PEL (OSHA): 2 MG/M3 (CEILING)

TLV (ACGIH): 2 MG/M3 (CEILING)

**ENGINEERING CONTROLS:**

Adequate ventilation to maintain air contaminants below exposure limits.

**PERSONAL PROTECTIVE EQUIPMENT:**

Use protective equipment in accordance with 29CFR 1910 Subpart I

**RESPIRATORY PROTECTION:**

A RESPIRATORY PROTECTION PROGRAM THAT MEETS OSHA'S 29 CFR 1910.134 AND ANSI Z88.2 REQUIREMENTS MUST BE FOLLOWED WHENEVER WORKPLACE CONDITIONS WARRANT A RESPIRATOR'S USE.  
USE AIR PURIFYING RESPIRATORS WITHIN USE LIMITATIONS ASSOCIATED WITH THE EQUIPMENT OR ELSE USE SUPPLIED AIR-RESPIRATORS.  
If air-purifying respirator use is appropriate, use a respirator with dust/mist filters.

**SKIN PROTECTION:**

neoprene gloves-- Wash off after each use. Replace as necessary.

**EYE PROTECTION:**

splash proof chemical goggles

## 9 Physical & Chemical Properties

Specific Grav. (70F,21C)	1.251	Vapor Pressure (mmHG)	~ 18.0
Freeze Point (F)	5	Vapor Density (air=1)	< 1.00
Freeze Point (C)	-15		
Viscosity(cps 70F,21C)	8	% Solubility (water)	100.0

Odor	Slight
Appearance	Red-Purple
Physical State	Liquid
Flash Point	P-M(CC) > 200F > 93C
pH As Is (approx.)	11.8
Evaporation Rate (Ether=1)	< 1.00
Percent VOC:	0.0

NA = not applicable ND = not determined

## 10 Stability & Reactivity

**STABILITY:**

Stable under normal storage conditions.

**HAZARDOUS POLYMERIZATION:**

Will not occur.

**INCOMPATIBILITIES:**

May react with strong oxidizers.

**DECOMPOSITION PRODUCTS:**

elemental oxides

**INTERNAL PUMPOUT/CLEANOUT CATEGORIES:**

"B"

## 11 Toxicological Information

Oral LD50 RAT:	>500 mg/kg
NOTE - Estimated value	
Dermal LD50 RABBIT:	>2,000 mg/kg
NOTE - Estimated value	

## 12 Ecological Information

#### AQUATIC TOXICOLOGY

Daphnia magna 48 Hour Static Acute Bioassay (pH adjusted)  
LC50= 390; 5% Mortality= 240 mg/L  
Fathead Minnow 96 Hour Static Acute Bioassay (pH adjusted)  
LC50= 4822; No Effect Level= 1800 mg/L

#### BIODEGRADATION

No Data Available.

### 13 Disposal Considerations

If this undiluted product is discarded as a waste, the US RCRA hazardous waste identification number is :  
Not applicable.

Please be advised; however, that state and local requirements for waste disposal may be more restrictive or otherwise different from federal regulations. Consult state and local regulations regarding the proper disposal of this material.

### 14 Transport Information

DOT HAZARD: Corrosive to aluminum, RQ  
PROPER SHIPPING NAME: CORROSIVE LIQUID, BASIC, INORGANIC,  
N.O.S. (SODIUM HYDROXIDE)  
8, UN 3266, PG III, (SODIUM NITRITE)  
RQ

DOT EMERGENCY RESPONSE GUIDE #: 154

Note: Some containers may be DOT exempt, please check BOL for exact container classification

### 15 Regulatory Information

#### TSCA:

All components of this product are listed in the TSCA inventory.

#### CERCLA AND/OR SARA REPORTABLE QUANTITY (RQ):

86 gallons due to SODIUM NITRITE;

#### SARA SECTION 312 HAZARD CLASS:

Immediate (acute); Delayed (Chronic)

#### SARA SECTION 302 CHEMICALS:

No regulated constituent present at OSHA thresholds

#### SARA SECTION 313 CHEMICALS:

CAS#	CHEMICAL NAME	RANGE
7632-00-0	SODIUM NITRITE	11.0-15.0%
7631-99-4	SODIUM NITRATE	6.0-10.0%

#### CALIFORNIA REGULATORY INFORMATION

##### CALIFORNIA SAFE DRINKING WATER AND TOXIC

##### ENFORCEMENT ACT (PROPOSITION 65):

This product contains one or more ingredients known to the state of California to cause cancer.

#### MICHIGAN REGULATORY INFORMATION

No regulated constituent present at OSHA thresholds

### 16 Other Information

NFPA/HMIS

CODE TRANSLATION

Health	2	Moderate Hazard
Fire	1	Slight Hazard
Reactivity	0	Minimal Hazard
Special	NONE	No special Hazard
(1) Protective Equipment	B	Goggles,Gloves

(1) refer to section 8 of MSDS for additional protective equipment recommendations.

CHANGE LOG

	EFFECTIVE DATE	REVISIONS TO SECTION:	SUPERCEDES
	-----	-----	-----
MSDS status:	30-JAN-1997		** NEW **
	01-MAY-1997	2,3,5,8,14	30-JAN-1997
	13-MAY-1997	15;EDIT:9	01-MAY-1997
	20-AUG-1997	2,3,8	13-MAY-1997
	11-FEB-1998	2,3,8	20-AUG-1997
	01-APR-2004	15	11-FEB-1998
	26-MAY-2006	8	01-APR-2004



**GE Betz**

GE Betz, Inc.  
4636 Somerton Road  
Trevose, PA 19053  
Business telephone: (215) 355-3300

Material Safety Data Sheet

Issue Date: 14-JUN-2005

**EMERGENCY TELEPHONE (Health/Accident): (800) 877-1940**

---

## 1 PRODUCT IDENTIFICATION

PRODUCT NAME:

**SPECTRUS NX114**

PRODUCT APPLICATION AREA:

**BIOCIDE**

## 2 COMPOSITION / INFORMATION ON INGREDIENTS

Information for specific product ingredients as required by the U.S. OSHA HAZARD COMMUNICATION STANDARD is listed. Refer to additional sections of this MSDS for our assessment of the potential hazards of this formulation.

### HAZARDOUS INGREDIENTS:

CAS#	CHEMICAL NAME
52-51-7	2-BROMO-2-NITROPROPANE-1,3-DIOL Toxic (by ingestion); irritant (eyes); potential sensitizer (skin)
10377-60-3	MAGNESIUM NITRATE Oxidizer; irritant (eyes and skin)
26172-55-4	5-CHLORO-2-METHYL-4-ISOTHIAZOLIN-3-ONE Corrosive; toxic (by ingestion and skin absorption); sensitizer (skin)
7786-30-3	MAGNESIUM CHLORIDE Potential irritant

No component is considered to be a carcinogen by the National Toxicology Program, the International Agency for Research on Cancer, or the Occupational Safety and Health Administration at OSHA thresholds for carcinogens.

## 3 HAZARDS IDENTIFICATION

\*\*\*\*\*

## EMERGENCY OVERVIEW

### DANGER

Corrosive to skin. Skin sensitizer with delayed onset of symptoms.  
Corrosive to the eyes. Mists/aerosols cause irritation to the upper  
respiratory tract.

DOT hazard: Corrosive to skin/steel  
Emergency Response Guide #153  
Odor: None; Appearance: Colorless To Yellow Green, Liquid

Fire fighters should wear positive pressure self-contained breathing  
apparatus (full face-piece type). Proper fire-extinguishing media:  
dry chemical, carbon dioxide, foam or water

\*\*\*\*\*

## POTENTIAL HEALTH EFFECTS

### ACUTE SKIN EFFECTS:

Primary route of exposure; Corrosive to skin. Skin sensitizer with  
delayed onset of symptoms.

### ACUTE EYE EFFECTS:

Corrosive to the eyes.

### ACUTE RESPIRATORY EFFECTS:

Mists/aerosols cause irritation to the upper respiratory tract.

### INGESTION EFFECTS:

May cause severe irritation or burning of the gastrointestinal  
tract.

### TARGET ORGANS:

Prolonged or repeated exposures may cause tissue necrosis and/or  
skin sensitization.

### MEDICAL CONDITIONS AGGRAVATED:

Not known.

### SYMPTOMS OF EXPOSURE:

Direct contact with skin will cause severe delayed skin reactions  
or burns if not washed off immediately- follow first aid  
instructions.

## 4 FIRST AID MEASURES

### SKIN CONTACT:

URGENT! Wash thoroughly with soap and water. Remove contaminated  
clothing. Get immediate medical attention. Thoroughly wash clothing  
before reuse.

### EYE CONTACT:

URGENT! Immediately flush eyes with plenty of low-pressure water  
for at least 20 minutes while removing contact lenses. Hold eyelids  
apart. Get immediate medical attention.

### INHALATION:

Remove to fresh air. If breathing is difficult, give oxygen. If  
breathing has stopped, give artificial respiration. Get immediate  
medical attention.



**INGESTION:**

Do not feed anything by mouth to an unconscious or convulsive victim. Do not induce vomiting. Immediately contact physician. Dilute contents of stomach using 3-4 glasses milk or water.

**NOTES TO PHYSICIANS:**

No special instructions

## 5 FIRE FIGHTING MEASURES

**FIRE FIGHTING INSTRUCTIONS:**

Fire fighters should wear positive pressure self-contained breathing apparatus (full face-piece type).

**EXTINGUISHING MEDIA:**

dry chemical, carbon dioxide, foam or water

**HAZARDOUS DECOMPOSITION PRODUCTS:**

Thermal decomposition (destructive fires) yields elemental oxides.

**FLASH POINT:**

> 200F > 93C P-M(CC)

**MISCELLANEOUS:**

Corrosive to skin/steel  
UN3265;Emergency Response Guide #153

## 6 ACCIDENTAL RELEASE MEASURES

**PROTECTION AND SPILL CONTAINMENT:**

Ventilate area. Use specified protective equipment. Contain and absorb on absorbent material. Place in waste disposal container. Do not add decontaminant solution to waste drum containing biocide or adsorbent. Decontaminate floor residual with 10% metabisulfite solution. Use 10 volumes of solution to one volume of spill.

**DISPOSAL INSTRUCTIONS:**

Water contaminated with this product may be sent to a sanitary sewer treatment facility, in accordance with any local agreement, a permitted waste treatment facility or discharged under a permit. Product as is - Dispose of in approved pesticide facility or according to label instructions.

## 7 HANDLING & STORAGE

**HANDLING:**

Contains an oxidizer. Avoid all contact with reducing agents, oils, greases, organics and acids. Corrosive to skin and/or eyes.

**STORAGE:**

Keep containers closed when not in use. If frozen, thaw completely and mix thoroughly prior to use.

## 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

**EXPOSURE LIMITS****CHEMICAL NAME**

2-BROMO-2-NITROPROPANE-1,3-DIOL

PEL (OSHA): NOT DETERMINED

TLV (ACGIH): NOT DETERMINED

MAGNESIUM NITRATE

PEL (OSHA): NOT DETERMINED

TLV (ACGIH): NOT DETERMINED

5-CHLORO-2-METHYL-4-ISOTHIAZOLIN-3-ONE

PEL (OSHA): NOT DETERMINED

TLV (ACGIH): NOT DETERMINED

MISC: Note-mfg. sugg. exp. limit:0.1 mg/m3 TWA;0.3mg/m3 STEL total isothiazoline).

MAGNESIUM CHLORIDE

PEL (OSHA): NOT DETERMINED

TLV (ACGIH): NOT DETERMINED

**ENGINEERING CONTROLS:**

Adequate ventilation to maintain air contaminants below exposure limits.

**PERSONAL PROTECTIVE EQUIPMENT:**

Use protective equipment in accordance with 29CFR 1910 Subpart I

**RESPIRATORY PROTECTION:**

A RESPIRATORY PROTECTION PROGRAM THAT MEETS OSHA'S 29 CFR 1910.134 AND ANSI Z88.2 REQUIREMENTS MUST BE FOLLOWED WHENEVER WORKPLACE CONDITIONS WARRANT A RESPIRATOR'S USE.

USE AIR PURIFYING RESPIRATORS WITHIN USE LIMITATIONS ASSOCIATED WITH THE EQUIPMENT OR ELSE USE SUPPLIED AIR-RESPIRATORS.

If air-purifying respirator use is appropriate, use a respirator with organic vapor/acid gas cartridges and dust/mist prefilters.

**SKIN PROTECTION:**

gauntlet-type butyl gloves, chemical resistant apron-- Wash off after each use. Replace as necessary.

**EYE PROTECTION:**

splash proof chemical goggles, face shield

## 9 PHYSICAL & CHEMICAL PROPERTIES

Specific Grav. (70F,21C)	1.107	Vapor Pressure (mmHG)	~ 18.0
Freeze Point (F)	24	Vapor Density (air=1)	< 1.00
Freeze Point (C)	-4		
Viscosity(cps 70F,21C)	10	% Solubility (water)	100.0

Odor	None
Appearance	Colorless To Yellow Green
Physical State	Liquid
Flash Point	P-M(CC) > 200F > 93C
pH As Is (approx.)	3.0
Evaporation Rate (Ether=1)	< 1.00

NA = not applicable ND = not determined

## 10 STABILITY & REACTIVITY

**STABILITY:**

Stable under normal storage conditions.

**HAZARDOUS POLYMERIZATION:**

Will not occur.

**INCOMPATIBILITIES:**

MAY REACT WITH STRONG REDUCING AGENTS.

**DECOMPOSITION PRODUCTS:**

Thermal decomposition (destructive fires) yields elemental oxides.

**INTERNAL PUMPOUT/CLEANOUT CATEGORIES:**

"B"

## 11 TOXICOLOGICAL INFORMATION

Oral LD50 RAT:	1,030 mg/kg
Dermal LD50 RABBIT:	>2,000 mg/kg
Skin Irritation Score RABBIT:	CORROSIVE
Eye Irritation Score RABBIT:	CORROSIVE
Skin Sensitization G.PIG:	NEGATIVE

## 12 ECOLOGICAL INFORMATION

### AQUATIC TOXICOLOGY

Ceriodaphnia 48 Hour Static Renewal Bioassay  
LC50= 4.7; No Effect Level= .63 mg/L

Daphnia magna 48 Hour Static Renewal Bioassay  
LC50= 5; No Effect Level= 2.5 mg/L

Fathead Minnow 96 Hour Static Renewal Bioassay  
LC50= 3.5; No Effect Level= 1.8 mg/L

Mysid Shrimp 48 Hour Static Renewal Bioassay  
LC50= 40.5; No Effect Level= 18 mg/L

Sheepshead Minnow 96 Hour Static Renewal Bioassay  
LC50= 26.7; No Effect Level= 15.5 mg/L

### BIODEGRADATION

BOD-28 (mg/g): 4  
BOD-5 (mg/g): 2  
COD (mg/g): 78  
TOC (mg/g): 29

## 13 DISPOSAL CONSIDERATIONS

If this undiluted product is discarded as a waste, the US RCRA hazardous waste identification number is :  
D002=Corrosive(steel).

Please be advised; however, that state and local requirements for waste disposal may be more restrictive or otherwise different from federal regulations. Consult state and local regulations regarding the proper disposal of this material.

## 14 TRANSPORT INFORMATION

DOT HAZARD:	Corrosive to skin/steel
UN / NA NUMBER:	UN3265
DOT EMERGENCY RESPONSE GUIDE #:	153

## 15 REGULATORY INFORMATION

### TSCA:

This is an EPA registered biocide and is exempt from TSCA inventory requirements.

### CERCLA AND/OR SARA REPORTABLE QUANTITY (RQ):

No regulated constituent present at OSHA thresholds

### FIFRA REGISTRATION NUMBER:

3876- 151

### FOOD AND DRUG ADMINISTRATION:

21 CFR 176.300 & 176.170 (slimicides and as a preservative)  
When used in this specified application, all ingredients comprising this product are authorized by FDA for the

manufacture of paper and paperboard that may contact aqueous and fatty foods as per 21 CFR 176.170(a)(4).

**USDA FOOD PLANT APPROVALS:**

SEC.G5,G7

**SARA SECTION 312 HAZARD CLASS:**

Immediate(acute);Delayed(Chronic)

**SARA SECTION 302 CHEMICALS:**

No regulated constituent present at OSHA thresholds

**SARA SECTION 313 CHEMICALS:**

CAS#	CHEMICAL NAME	RANGE
10377-60-3	MAGNESIUM NITRATE	2.0-5.0%

**CALIFORNIA REGULATORY INFORMATION**

**CALIFORNIA SAFE DRINKING WATER AND TOXIC**

**ENFORCEMENT ACT (PROPOSITION 65) CHEMICALS PRESENT:**

No regulated constituents present

**MICHIGAN REGULATORY INFORMATION**

No regulated constituent present at OSHA thresholds

## 16 OTHER INFORMATION

NFPA/HMIS		CODE TRANSLATION
Health	3	Serious Hazard
Fire	1	Slight Hazard
Reactivity	0	Minimal Hazard
Special	CORR	DOT corrosive
(1) Protective Equipment	D	Goggles,Face Shield,Gloves,Apron

(1) refer to section 8 of MSDS for additional protective equipment recommendations.

**CHANGE LOG**

	EFFECTIVE DATE	REVISIONS TO SECTION:	SUPERCEDES
	-----	-----	-----
MSDS status:	18-SEP-1997		** NEW **
	26-FEB-1998	12	18-SEP-1997
	20-MAY-1998	15	26-FEB-1998
	22-MAY-1998	2	20-MAY-1998
	07-JUL-1998	12	22-MAY-1998
	15-DEC-1998	7	07-JUL-1998
	01-APR-1999	12	15-DEC-1998
	05-NOV-1999	12	01-APR-1999
	11-MAY-2001	4	05-NOV-1999
	17-JAN-2002	10	11-MAY-2001
	29-SEP-2003	15	17-JAN-2002
	14-JUN-2005	3.9	29-SEP-2003



**GE Betz**

GE Betz, Inc.  
4636 Somerton Road  
Trevose, PA 19053  
Business telephone: (215) 355-3300

Material Safety Data Sheet

Issue Date: 14-JUN-2005

**EMERGENCY TELEPHONE (Health/Accident): (800) 877-1940**

---

## 1 PRODUCT IDENTIFICATION

PRODUCT NAME:

**SPECTRUS NX114**

PRODUCT APPLICATION AREA:

**BIOCIDE**

## 2 COMPOSITION / INFORMATION ON INGREDIENTS

Information for specific product ingredients as required by the U.S. OSHA HAZARD COMMUNICATION STANDARD is listed. Refer to additional sections of this MSDS for our assessment of the potential hazards of this formulation.

### HAZARDOUS INGREDIENTS:

CAS#	CHEMICAL NAME
52-51-7	2-BROMO-2-NITROPROPANE-1,3-DIOL Toxic (by ingestion); irritant (eyes); potential sensitizer (skin)
10377-60-3	MAGNESIUM NITRATE Oxidizer; irritant (eyes and skin)
26172-55-4	5-CHLORO-2-METHYL-4-ISOTHIAZOLIN-3-ONE Corrosive; toxic (by ingestion and skin absorption); sensitizer (skin)
7786-30-3	MAGNESIUM CHLORIDE Potential irritant

No component is considered to be a carcinogen by the National Toxicology Program, the International Agency for Research on Cancer, or the Occupational Safety and Health Administration at OSHA thresholds for carcinogens.

## 3 HAZARDS IDENTIFICATION

\*\*\*\*\*

**EMERGENCY OVERVIEW**

**DANGER**

Corrosive to skin. Skin sensitizer with delayed onset of symptoms.  
Corrosive to the eyes. Mists/aerosols cause irritation to the upper  
respiratory tract.

DOT hazard: Corrosive to skin/steel  
Emergency Response Guide #153  
Odor: None; Appearance: Colorless To Yellow Green, Liquid

Fire fighters should wear positive pressure self-contained breathing  
apparatus(full face-piece type). Proper fire-extinguishing media:  
dry chemical, carbon dioxide, foam or water

\*\*\*\*\*

**POTENTIAL HEALTH EFFECTS**

**ACUTE SKIN EFFECTS:**

Primary route of exposure; Corrosive to skin. Skin sensitizer with  
delayed onset of symptoms.

**ACUTE EYE EFFECTS:**

Corrosive to the eyes.

**ACUTE RESPIRATORY EFFECTS:**

Mists/aerosols cause irritation to the upper respiratory tract.

**INGESTION EFFECTS:**

May cause severe irritation or burning of the gastrointestinal  
tract.

**TARGET ORGANS:**

Prolonged or repeated exposures may cause tissue necrosis and/or  
skin sensitization.

**MEDICAL CONDITIONS AGGRAVATED:**

Not known.

**SYMPTOMS OF EXPOSURE:**

Direct contact with skin will cause severe delayed skin reactions  
or burns if not washed off immediately- follow first aid  
instructions.

**4 FIRST AID MEASURES**

**SKIN CONTACT:**

URGENT! Wash thoroughly with soap and water. Remove contaminated  
clothing. Get immediate medical attention. Thoroughly wash clothing  
before reuse.

**EYE CONTACT:**

URGENT! Immediately flush eyes with plenty of low-pressure water  
for at least 20 minutes while removing contact lenses. Hold eyelids  
apart. Get immediate medical attention.

**INHALATION:**

Remove to fresh air. If breathing is difficult, give oxygen. If  
breathing has stopped, give artificial respiration. Get immediate  
medical attention.

**INGESTION:**

Do not feed anything by mouth to an unconscious or convulsive victim. Do not induce vomiting. Immediately contact physician. Dilute contents of stomach using 3-4 glasses milk or water.

**NOTES TO PHYSICIANS:**

No special instructions

## 5 FIRE FIGHTING MEASURES

**FIRE FIGHTING INSTRUCTIONS:**

Fire fighters should wear positive pressure self-contained breathing apparatus (full face-piece type).

**EXTINGUISHING MEDIA:**

dry chemical, carbon dioxide, foam or water

**HAZARDOUS DECOMPOSITION PRODUCTS:**

Thermal decomposition (destructive fires) yields elemental oxides.

**FLASH POINT:**

> 200F > 93C P-M(CC)

**MISCELLANEOUS:**

Corrosive to skin/steel  
UN3265;Emergency Response Guide #153

## 6 ACCIDENTAL RELEASE MEASURES

**PROTECTION AND SPILL CONTAINMENT:**

Ventilate area. Use specified protective equipment. Contain and absorb on absorbent material. Place in waste disposal container. Do not add decontaminant solution to waste drum containing biocide or adsorbent. Decontaminate floor residual with 10% metabisulfite solution. Use 10 volumes of solution to one volume of spill.

**DISPOSAL INSTRUCTIONS:**

Water contaminated with this product may be sent to a sanitary sewer treatment facility, in accordance with any local agreement, a permitted waste treatment facility or discharged under a permit. Product as is - Dispose of in approved pesticide facility or according to label instructions.

## 7 HANDLING & STORAGE

**HANDLING:**

Contains an oxidizer. Avoid all contact with reducing agents, oils, greases, organics and acids. Corrosive to skin and/or eyes.

**STORAGE:**

Keep containers closed when not in use. If frozen, thaw completely and mix thoroughly prior to use.

## 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

**EXPOSURE LIMITS****CHEMICAL NAME**

2-BROMO-2-NITROPROPANE-1,3-DIOL

PEL (OSHA): NOT DETERMINED

TLV (ACGIH): NOT DETERMINED

MAGNESIUM NITRATE

PEL (OSHA): NOT DETERMINED

TLV (ACGIH): NOT DETERMINED

5-CHLORO-2-METHYL-4-ISOTHIAZOLIN-3-ONE

PEL (OSHA): NOT DETERMINED

TLV (ACGIH): NOT DETERMINED

MISC: Note-mfg. sugg. exp. limit:0.1 mg/m3 TWA;0.3mg/m3 STEL total isothiazoline).

MAGNESIUM CHLORIDE

PEL (OSHA): NOT DETERMINED

TLV (ACGIH): NOT DETERMINED

**ENGINEERING CONTROLS:**

Adequate ventilation to maintain air contaminants below exposure limits.

**PERSONAL PROTECTIVE EQUIPMENT:**

Use protective equipment in accordance with 29CFR 1910 Subpart I

**RESPIRATORY PROTECTION:**

A RESPIRATORY PROTECTION PROGRAM THAT MEETS OSHA'S 29 CFR 1910.134 AND ANSI Z88.2 REQUIREMENTS MUST BE FOLLOWED WHENEVER WORKPLACE CONDITIONS WARRANT A RESPIRATOR'S USE.

USE AIR PURIFYING RESPIRATORS WITHIN USE LIMITATIONS ASSOCIATED WITH THE EQUIPMENT OR ELSE USE SUPPLIED AIR-RESPIRATORS.

If air-purifying respirator use is appropriate, use a respirator with organic vapor/acid gas cartridges and dust/mist prefilters.

**SKIN PROTECTION:**

gauntlet-type butyl gloves, chemical resistant apron-- Wash off after each use. Replace as necessary.

**EYE PROTECTION:**

splash proof chemical goggles, face shield

## 9 PHYSICAL & CHEMICAL PROPERTIES

Specific Grav. (70F,21C)	1.107	Vapor Pressure (mmHG)	~ 18.0
Freeze Point (F)	24	Vapor Density (air=1)	< 1.00
Freeze Point (C)	-4		
Viscosity(cps 70F,21C)	10	% Solubility (water)	100.0

Odor	None
Appearance	Colorless To Yellow Green
Physical State	Liquid
Flash Point	P-M(CC) > 200F > 93C
pH As Is (approx.)	3.0
Evaporation Rate (Ether=1)	< 1.00

NA = not applicable ND = not determined

## 10 STABILITY & REACTIVITY

**STABILITY:**

Stable under normal storage conditions.

**HAZARDOUS POLYMERIZATION:**

Will not occur.

**INCOMPATIBILITIES:**

MAY REACT WITH STRONG REDUCING AGENTS.

**DECOMPOSITION PRODUCTS:**

Thermal decomposition (destructive fires) yields elemental oxides.

**INTERNAL PUMPOUT/CLEANOUT CATEGORIES:**

"B"



## 11 TOXICOLOGICAL INFORMATION

Oral LD50 RAT:	1,030 mg/kg
Dermal LD50 RABBIT:	>2,000 mg/kg
Skin Irritation Score RABBIT:	CORROSIVE
Eye Irritation Score RABBIT:	CORROSIVE
Skin Sensitization G.PIG:	NEGATIVE

## 12 ECOLOGICAL INFORMATION

### AQUATIC TOXICOLOGY

Ceriodaphnia 48 Hour Static Renewal Bioassay  
LC50= 4.7; No Effect Level= .63 mg/L

Daphnia magna 48 Hour Static Renewal Bioassay  
LC50= 5; No Effect Level= 2.5 mg/L

Fathead Minnow 96 Hour Static Renewal Bioassay  
LC50= 3.5; No Effect Level= 1.8 mg/L

Mysid Shrimp 48 Hour Static Renewal Bioassay  
LC50= 40.5; No Effect Level= 18 mg/L

Sheepshead Minnow 96 Hour Static Renewal Bioassay  
LC50= 26.7; No Effect Level= 15.5 mg/L

### BIODEGRADATION

BOD-28 (mg/g): 4  
BOD-5 (mg/g): 2  
COD (mg/g): 78  
TOC (mg/g): 29

## 13 DISPOSAL CONSIDERATIONS

If this undiluted product is discarded as a waste, the US RCRA hazardous waste identification number is :  
D002=Corrosive(steel).

Please be advised; however, that state and local requirements for waste disposal may be more restrictive or otherwise different from federal regulations. Consult state and local regulations regarding the proper disposal of this material.

## 14 TRANSPORT INFORMATION

DOT HAZARD:	Corrosive to skin/steel
UN / NA NUMBER:	UN3265
DOT EMERGENCY RESPONSE GUIDE #:	153

## 15 REGULATORY INFORMATION

### TSCA:

This is an EPA registered biocide and is exempt from TSCA inventory requirements.

### CERCLA AND/OR SARA REPORTABLE QUANTITY (RQ):

No regulated constituent present at OSHA thresholds

### FIFRA REGISTRATION NUMBER:

3876- 151

### FOOD AND DRUG ADMINISTRATION:

21 CFR 176.300 & 176.170 (slimicides and as a preservative)  
When used in this specified application, all ingredients comprising this product are authorized by FDA for the

manufacture of paper and paperboard that may contact aqueous and fatty foods as per 21 CFR 176.170(a)(4).

**USDA FOOD PLANT APPROVALS:**

SEC.G5,G7

**SARA SECTION 312 HAZARD CLASS:**

Immediate(acute);Delayed(Chronic)

**SARA SECTION 302 CHEMICALS:**

No regulated constituent present at OSHA thresholds

**SARA SECTION 313 CHEMICALS:**

CAS#	CHEMICAL NAME	RANGE
10377-60-3	MAGNESIUM NITRATE	2.0-5.0%

**CALIFORNIA REGULATORY INFORMATION**

**CALIFORNIA SAFE DRINKING WATER AND TOXIC**

**ENFORCEMENT ACT (PROPOSITION 65) CHEMICALS PRESENT:**

No regulated constituents present

**MICHIGAN REGULATORY INFORMATION**

No regulated constituent present at OSHA thresholds

## 16 OTHER INFORMATION

NFPA/HMIS		CODE TRANSLATION
Health	3	Serious Hazard
Fire	1	Slight Hazard
Reactivity	0	Minimal Hazard
Special	CORR	DOT corrosive
(1) Protective Equipment	D	Goggles,Face Shield,Gloves,Apron

(1) refer to section 8 of MSDS for additional protective equipment recommendations.

**CHANGE LOG**

	EFFECTIVE DATE	REVISIONS TO SECTION:	SUPERCEDES
	-----	-----	-----
MSDS status:	18-SEP-1997		** NEW **
	26-FEB-1998	12	18-SEP-1997
	20-MAY-1998	15	26-FEB-1998
	22-MAY-1998	2	20-MAY-1998
	07-JUL-1998	12	22-MAY-1998
	15-DEC-1998	7	07-JUL-1998
	01-APR-1999	12	15-DEC-1998
	05-NOV-1999	12	01-APR-1999
	11-MAY-2001	4	05-NOV-1999
	17-JAN-2002	10	11-MAY-2001
	29-SEP-2003	15	17-JAN-2002
	14-JUN-2005	3.9	29-SEP-2003



**GE Betz**

GE Betz, Inc.  
4636 Somerton Road  
Trevose, PA 19053  
Business telephone: (215) 355-3300

Material Safety Data Sheet

Issue Date: 23-APR-2001

**EMERGENCY TELEPHONE (Health/Accident): (800) 877-1940**

## 1 PRODUCT IDENTIFICATION

PRODUCT NAME:

**CORTROL IS104**

PRODUCT APPLICATION AREA:

**OXYGEN SCAVENGER.**

## 2 COMPOSITION / INFORMATION ON INGREDIENTS

Information for specific product ingredients as required by the U.S. OSHA HAZARD COMMUNICATION STANDARD is listed. Refer to additional sections of this MSDS for our assessment of the potential hazards of this formulation.

### HAZARDOUS INGREDIENTS:

CAS#	CHEMICAL NAME
10117-38-1	SULFUROUS ACID, DIPOTASSIUM SALT Transient irritant; potential sensitizer (skin and respiratory)

No component is considered to be a carcinogen by the National Toxicology Program, the International Agency for Research on Cancer, or the Occupational Safety and Health Administration at OSHA thresholds for carcinogens.

## 3 HAZARDS IDENTIFICATION

\*\*\*\*\*

### EMERGENCY OVERVIEW

#### WARNING

May cause moderate irritation to the skin. Potential skin sensitizer. May cause moderate irritation to the eyes. May cause irritation to mucous membranes. Repeated exposure may result in respiratory sensitization.

DOT hazard is not applicable  
Emergency Response Guide is not applicable

Odor: Slight; Appearance: Colorless To Light Yellow, Liquid

Fire fighters should wear positive pressure self-contained breathing apparatus (full face-piece type). Proper fire-extinguishing media: dry chemical, carbon dioxide, foam or water

\*\*\*\*\*

#### POTENTIAL HEALTH EFFECTS

##### ACUTE SKIN EFFECTS:

Primary route of exposure; May cause moderate irritation to the skin. Potential skin sensitizer.

##### ACUTE EYE EFFECTS:

May cause moderate irritation to the eyes.

##### ACUTE RESPIRATORY EFFECTS:

Primary route of exposure; May cause irritation to mucous membranes. Repeated exposure may result in respiratory sensitization.

##### INGESTION EFFECTS:

May cause gastrointestinal irritation with possible nausea, vomiting, abdominal discomfort and diarrhea.

##### TARGET ORGANS:

Prolonged or repeated exposures may cause primary irritant dermatitis and/or allergic respiratory reactions.

##### MEDICAL CONDITIONS AGGRAVATED:

Asthma.

##### SYMPTOMS OF EXPOSURE:

May cause local irritation or a sensitization reaction upon direct contact with skin or respiratory tract.

## 4 FIRST AID MEASURES

##### SKIN CONTACT:

Wash thoroughly with soap and water. Remove contaminated clothing. Thoroughly wash clothing before reuse. Get medical attention if irritation develops or persists.

##### EYE CONTACT:

Remove contact lenses. Hold eyelids apart. Immediately flush eyes with plenty of low-pressure water for at least 15 minutes. Get immediate medical attention.

##### INHALATION:

If nasal, throat or lung irritation develops - remove to fresh air and get medical attention.

##### INGESTION:

Do not feed anything by mouth to an unconscious or convulsive victim. Do not induce vomiting. Immediately contact physician. Dilute contents of stomach using 3-4 glasses milk or water.

##### NOTES TO PHYSICIANS:

No special instructions

## 5 FIRE FIGHTING MEASURES

**FIRE FIGHTING INSTRUCTIONS:**

Fire fighters should wear positive pressure self-contained breathing apparatus (full face-piece type).

**EXTINGUISHING MEDIA:**

dry chemical, carbon dioxide, foam or water

**HAZARDOUS DECOMPOSITION PRODUCTS:**

Thermal decomposition (destructive fires) yields elemental oxides.

**FLASH POINT:**

> 200F > 93C P-M(CC)

## 6 ACCIDENTAL RELEASE MEASURES

**PROTECTION AND SPILL CONTAINMENT:**

Ventilate area. Use specified protective equipment. Contain and absorb on absorbent material. Place in waste disposal container. Flush area with water. Wet area may be slippery. Spread sand/grit.

**DISPOSAL INSTRUCTIONS:**

Water contaminated with this product may be sent to a sanitary sewer treatment facility, in accordance with any local agreement, a permitted waste treatment facility or discharged under a permit. Product as is - Incinerate or land dispose in an approved landfill.

## 7 HANDLING & STORAGE

**HANDLING:**

Normal chemical handling.

**STORAGE:**

Keep containers closed when not in use. Protect from freezing. Preferably stored between 40-100F (5-40C).

## 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

**EXPOSURE LIMITS****CHEMICAL NAME**

SULFUROUS ACID, DIPOTASSIUM SALT

PEL (OSHA): NOT DETERMINED

TLV (ACGIH): NOT DETERMINED

**ENGINEERING CONTROLS:**

adequate ventilation

**PERSONAL PROTECTIVE EQUIPMENT:**

Use protective equipment in accordance with 29CFR 1910 Subpart I

**RESPIRATORY PROTECTION:**

A RESPIRATORY PROTECTION PROGRAM THAT MEETS OSHA'S 29 CFR 1910.134 AND ANSI Z88.2 REQUIREMENTS MUST BE FOLLOWED WHENEVER WORKPLACE CONDITIONS WARRANT A RESPIRATOR'S USE.

USE AIR PURIFYING RESPIRATORS WITHIN USE LIMITATIONS ASSOCIATED WITH THE EQUIPMENT OR ELSE USE SUPPLIED AIR-RESPIRATORS.

If air-purifying respirator use is appropriate, use a respirator with dust/mist filters.

**SKIN PROTECTION:**

neoprene gloves-- Wash off after each use. Replace as necessary.

**EYE PROTECTION:**

splash proof chemical goggles

## 9 PHYSICAL & CHEMICAL PROPERTIES

Specific Grav. (70F, 21C)	1.462	Vapor Pressure (mmHG)	~ 18.0
Freeze Point (F)	< -30	Vapor Density (air=1)	< 1.00
Freeze Point (C)	< -34		
Viscosity (cps 70F, 21C)	7	% Solubility (water)	100.0

Odor	Slight
Appearance	Colorless To Light Yellow
Physical State	Liquid
Flash Point	P-M(CC) > 200F > 93C
pH As Is (approx.)	9.7
Evaporation Rate (Ether=1)	< 1.00

NA = not applicable    ND = not determined

## 10 STABILITY & REACTIVITY

### STABILITY:

Stable under normal storage conditions.

### HAZARDOUS POLYMERIZATION:

Will not occur.

### INCOMPATIBILITIES:

May react with strong oxidizers.

### DECOMPOSITION PRODUCTS:

Thermal decomposition (destructive fires) yields elemental oxides.

### INTERNAL PUMPOUT/CLEANOUT CATEGORIES:

"B"

## 11 TOXICOLOGICAL INFORMATION

Oral LD50 RAT:	>1,000 mg/kg
NOTE - Estimated value	
Dermal LD50 RABBIT:	>2,000 mg/kg
NOTE - Estimated value	

## 12 ECOLOGICAL INFORMATION

### AQUATIC TOXICOLOGY

Daphnia magna 48 Hour Static Screen  
50% Mortality= 2000; 0% Mortality= 1000 mg/L  
Fathead Minnow 96 Hour Static Renewal Bioassay  
LC50= 1760; No Effect Level= 1250 mg/L

### BIODEGRADATION

Product contains only inorganics that are not subject to typical biological degradation. Assimilation by microbes may occur in waste treatment or the environment.

## 13 DISPOSAL CONSIDERATIONS

If this undiluted product is discarded as a waste, the US RCRA hazardous waste identification number is :  
Not applicable.

Please be advised; however, that state and local requirements for waste disposal may be more restrictive or otherwise different from federal regulations. Consult state and local regulations regarding the proper disposal of this material.

## 14 TRANSPORT INFORMATION

DOT HAZARD: Not Applicable  
UN / NA NUMBER: Not applicable  
DOT EMERGENCY RESPONSE GUIDE #: Not applicable

## 15 REGULATORY INFORMATION

### TSCA:

All components of this product are listed in the TSCA inventory.

### CERCLA AND/OR SARA REPORTABLE QUANTITY (RQ):

No regulated constituent present at OSHA thresholds

### FOOD AND DRUG ADMINISTRATION:

ALL ingredients in this product are authorized in 21CFR173.310 for use as boiler water additives where the steam may contact food.

### SARA SECTION 312 HAZARD CLASS:

Immediate(acute);Delayed(Chronic)

### SARA SECTION 302 CHEMICALS:

No regulated constituent present at OSHA thresholds

### SARA SECTION 313 CHEMICALS:

No regulated constituent present at OSHA thresholds

### CALIFORNIA REGULATORY INFORMATION

#### CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65) CHEMICALS PRESENT:

No regulated constituent present at OSHA thresholds  
MICHIGAN REGULATORY INFORMATION

No regulated constituent present at OSHA thresholds

## 16 OTHER INFORMATION

NFPA/HMIS		CODE TRANSLATION
Health	2	Moderate Hazard
Fire	0	Minimal Hazard
Reactivity	0	Minimal Hazard
Special	NONE	No special Hazard
(1) Protective Equipment	B	Goggles,Gloves

(1) refer to section 8 of MSDS for additional protective equipment recommendations.

### CHANGE LOG

EFFECTIVE DATE	REVISIONS TO SECTION:	SUPERCEDES
-----	-----	-----

MSDS status: 14-FEB-1997

23-APR-1997 15

11-JUL-1997 15

23-APR-2001 4

\*\* NEW \*\*

14-FEB-1997

23-APR-1997

11-JUL-1997





# Material Safety Data Sheet

Issue Date: 27-OCT-2008  
Supersedes: 13-JUL-2007

## OPTISPERSE AP302

---

### 1 Identification

**Identification of substance or preparation**  
OPTISPERSE AP302

**Product Application Area**  
Water based internal boiler treatment chemical.

**Company/Undertaking Identification**  
GE Betz, Inc.  
4636 Somerton Road  
Trevose, PA 19053  
T 215 355-3300, F 215 953 5524

**Emergency Telephone**  
(800) 877-1940

Prepared by Product Stewardship Group: T 215-355-3300    Prepared on: 27-OCT-2008

### 2 Hazard(s) identification

\*\*\*\*\*  
**EMERGENCY OVERVIEW**

**CAUTION**

May cause slight irritation to the skin. May cause slight irritation to the eyes. Mists/aerosols may cause irritation to upper respiratory tract.

DOT hazard is not applicable  
Odor: Mild; Appearance: Yellow, Liquid

Fire fighters should wear positive pressure self-contained breathing apparatus(full face-piece type). Proper fire-extinguishing media: dry chemical, carbon dioxide, foam or water

\*\*\*\*\*  
**POTENTIAL HEALTH EFFECTS**

**ACUTE SKIN EFFECTS:**  
Primary route of exposure; May cause slight irritation to the skin.

**ACUTE EYE EFFECTS:**  
May cause slight irritation to the eyes.

**ACUTE RESPIRATORY EFFECTS:**  
Mists/aerosols may cause irritation to upper respiratory tract.

**INGESTION EFFECTS:**

May cause slight gastrointestinal irritation.

**TARGET ORGANS:**

No evidence of potential chronic effects.

**MEDICAL CONDITIONS AGGRAVATED:**

Not known.

**SYMPTOMS OF EXPOSURE:**

May cause redness or itching of skin.

### 3 Composition / information on ingredients

Information for specific product ingredients as required by the U.S. OSHA HAZARD COMMUNICATION STANDARD is listed. Refer to additional sections of this MSDS for our assessment of the potential hazards of this formulation.

**HAZARDOUS INGREDIENTS:**

This product is not hazardous as defined by OSHA regulations.

No component is considered to be a carcinogen by the National Toxicology Program, the International Agency for Research on Cancer, or the Occupational Safety and Health Administration at OSHA thresholds for carcinogens.

### 4 First-aid measures

**SKIN CONTACT:**

Wash thoroughly with soap and water. Remove contaminated clothing. Get medical attention if irritation develops or persists.

**EYE CONTACT:**

Remove contact lenses. Hold eyelids apart. Immediately flush eyes with plenty of low-pressure water for at least 15 minutes. Get medical attention if irritation persists after flushing.

**INHALATION:**

If nasal, throat or lung irritation develops - remove to fresh air and get medical attention.

**INGESTION:**

Do not feed anything by mouth to an unconscious or convulsive victim. Do not induce vomiting. Immediately contact physician. Dilute contents of stomach using 2-8 fluid ounces (60-240 mL) of milk or water.

**NOTES TO PHYSICIANS:**

No special instructions

### 5 Fire-fighting measures

**FIRE FIGHTING INSTRUCTIONS:**

Fire fighters should wear positive pressure self-contained breathing apparatus (full face-piece type).

**EXTINGUISHING MEDIA:**

dry chemical, carbon dioxide, foam or water

**HAZARDOUS DECOMPOSITION PRODUCTS:**

oxides of carbon and sulfur, hydrogen chloride

**FLASH POINT:**

> 200F > 93C P-M(CC)

## 6 Accidental release measures

**PROTECTION AND SPILL CONTAINMENT:**

Ventilate area. Use specified protective equipment. Contain and absorb on absorbent material. Place in waste disposal container. Flush area with water. Wet area may be slippery. Spread sand/grit.

**DISPOSAL INSTRUCTIONS:**

Water contaminated with this product may be sent to a sanitary sewer treatment facility, in accordance with any local agreement, a permitted waste treatment facility or discharged under a permit. Product as is - Incinerate or land dispose in an approved landfill.

## 7 Handling and storage

**HANDLING:**

Normal chemical handling.

**STORAGE:**

Keep containers closed when not in use. Do not freeze. If frozen, thaw and mix completely prior to use.

## 8 Exposure controls / personal protection

**EXPOSURE LIMITS**

This product is not hazardous as defined by OSHA regulations.

**ENGINEERING CONTROLS:**

adequate ventilation

**PERSONAL PROTECTIVE EQUIPMENT:**

Use protective equipment in accordance with 29CFR 1910 Subpart I

**RESPIRATORY PROTECTION:**

A RESPIRATORY PROTECTION PROGRAM THAT MEETS OSHA'S 29 CFR 1910.134 AND ANSI Z88.2 REQUIREMENTS MUST BE FOLLOWED WHENEVER WORKPLACE CONDITIONS WARRANT A RESPIRATOR'S USE.

USE AIR PURIFYING RESPIRATORS WITHIN USE LIMITATIONS ASSOCIATED WITH THE EQUIPMENT OR ELSE USE SUPPLIED AIR-RESPIRATORS.

If air-purifying respirator use is appropriate, use any of the following particulate respirators: N95, N99, N100, R95, R99, R100, P95, P99 or P100.

**SKIN PROTECTION:**

rubber, butyl, viton or neoprene gloves --- Wash off after each use. Replace as necessary.

**EYE PROTECTION:**

splash proof chemical goggles

## 9 Physical and chemical properties

Specific Grav. (70F, 21C)	1.208	Vapor Pressure (mmHG)	~ 18.0
Freeze Point (F)	21	Vapor Density (air=1)	< 1.00
Freeze Point (C)	-6		
Viscosity(cps 70F, 21C)	209	% Solubility (water)	100.0

Odor	Mild
Appearance	Yellow
Physical State	Liquid
Flash Point	P-M(CC) > 200F > 93C
pH As Is (approx.)	10.3
Evaporation Rate (Ether=1)	< 1.00
Percent VOC:	0.0

NA = not applicable    ND = not determined

## 10 Stability and reactivity

### STABILITY:

Stable under normal storage conditions.

### HAZARDOUS POLYMERIZATION:

Will not occur.

### INCOMPATIBILITIES:

May react with strong oxidizers.

### DECOMPOSITION PRODUCTS:

oxides of carbon and sulfur, hydrogen chloride

## 11 Toxicological information

Oral LD50 RAT:	>2,000 mg/kg
NOTE - Estimated value	
Dermal LD50 RABBIT:	>2,000 mg/kg
NOTE - Estimated value	

## 12 Ecological information

### AQUATIC TOXICOLOGY

Daphnia magna 48 Hour Static Renewal Bioassay  
LC50= 2730; No Effect Level= 1000 mg/L  
Fathead Minnow 96 Hour Static Renewal Bioassay  
LC50= 5100; No Effect Level= 2000 mg/L

### BIODEGRADATION

BOD-28 (mg/g): 0  
BOD-5 (mg/g): 0  
COD (mg/g): 390  
TOC (mg/g): 117

## 13 Disposal considerations

If this undiluted product is discarded as a waste, the US RCRA hazardous waste identification number is :  
Not applicable.

Please be advised; however, that state and local requirements for waste disposal may be more restrictive or otherwise different from federal regulations. Consult state and local regulations regarding the proper disposal of this material.

## 14 Transport information

DOT HAZARD: Not Applicable  
PROPER SHIPPING NAME:

DOT EMERGENCY RESPONSE GUIDE #: Not applicable  
Note: Some containers may be DOT exempt, please check BOL for exact container classification

## 15 Regulatory information

### TSCA:

All components of this product are included on or are in compliance with the U.S. TSCA regulations.

### CERCLA AND/OR SARA REPORTABLE QUANTITY (RQ):

No regulated constituent present at OSHA thresholds

### FOOD AND DRUG ADMINISTRATION:

ALL ingredients in this product are authorized in 21CFR173.310 for use as boiler water additives where the steam may contact food.

### NSF Registered and/or meets USDA (according to 1998 Guidelines):

Registration number: 139021

Category Code(s):

### SARA SECTION 312 HAZARD CLASS:

Product is non-hazardous under Section 311/312

### SARA SECTION 302 CHEMICALS:

No regulated constituent present at OSHA thresholds

### SARA SECTION 313 CHEMICALS:

No regulated constituent present at OSHA thresholds

### CALIFORNIA REGULATORY INFORMATION

### CALIFORNIA SAFE DRINKING WATER AND TOXIC

### ENFORCEMENT ACT (PROPOSITION 65):

No regulated constituents present

### MICHIGAN REGULATORY INFORMATION

No regulated constituent present at OSHA thresholds

## 16 Other information

HMIS VII		CODE TRANSLATION
Health	1	Slight Hazard
Fire	1	Slight Hazard
Reactivity	0	Minimal Hazard
Special	NONE	No special Hazard

(1) Protective Equipment B Goggles,Gloves

(1) refer to section 8 of MSDS for additional protective equipment recommendations.

**CHANGE LOG**

	EFFECTIVE DATE	REVISIONS TO SECTION:	SUPERCEDES
	-----	-----	-----
MSDS status:	21-MAY-1998		** NEW **
	05-OCT-1998	15	21-MAY-1998
	08-OCT-1998	15	05-OCT-1998
	20-JUL-1999	12	08-OCT-1998
	22-DEC-2000	12	20-JUL-1999
	25-JUN-2001	15	22-DEC-2000
	01-NOV-2001	15	25-JUN-2001
	18-MAR-2004	15	01-NOV-2001
	05-JAN-2006	4,8,15	18-MAR-2004
	01-DEC-2006	5,10	05-JAN-2006
	23-JAN-2007	15	01-DEC-2006
	29-JAN-2007	;EDIT:15	23-JAN-2007
	13-JUL-2007	4,8,15	29-JAN-2007
	27-OCT-2008	5,8,10	13-JUL-2007



# Material Safety Data Sheet

Issue Date: 17-JUN-2009  
Supercedes: 08-JUN-2006

## STEAMATE NA1321

---

### 1 Identification

**Identification of substance or preparation**  
STEAMATE NA1321

**Product Application Area**  
Steam condensate treatment.

**Company/Undertaking Identification**  
GE Betz, Inc.  
4636 Somerton Road  
Trevose, PA 19053  
T 215 355-3300, F 215 953 5524

**Emergency Telephone**  
(800) 877-1940

Prepared by Product Stewardship Group: T 215-355-3300    Prepared on: 17-JUN-2009

### 2 Hazard(s) identification

\*\*\*\*\*  
**EMERGENCY OVERVIEW**

**DANGER**

Corrosive to skin. Corrosive to the eyes. Vapors, gases, mists and/or aerosols cause irritation to the upper respiratory tract.

DOT hazard: Corrosive to skin  
Odor: Strong Ammonia; Appearance: Colorless To Light Yellow, Liquid

Fire fighters should wear positive pressure self-contained breathing apparatus (full face-piece type). Proper fire-extinguishing media: dry chemical, carbon dioxide, foam or water

\*\*\*\*\*

**POTENTIAL HEALTH EFFECTS**

**ACUTE SKIN EFFECTS:**  
Primary route of exposure; Corrosive to skin.

**ACUTE EYE EFFECTS:**  
Corrosive to the eyes.

**ACUTE RESPIRATORY EFFECTS:**  
Primary route of exposure; Vapors, gases, mists and/or aerosols cause irritation to the upper respiratory tract.

**INGESTION EFFECTS:**

Toxic;

May cause severe irritation or burning of mouth, throat, and gastrointestinal tract with severe chest and abdominal pain, nausea, vomiting, diarrhea, lethargy and collapse. Possible death when ingested in very large doses.

**TARGET ORGANS:**

Prolonged or repeated exposures may cause tissue necrosis.

**MEDICAL CONDITIONS AGGRAVATED:**

Not known.

**SYMPTOMS OF EXPOSURE:**

Symptoms range from headache, eye irritation, chest pain, nausea and vomiting to severe coughing, difficulty in breathing, pulmonary edema and production of pink frothy sputum.

### 3 Composition / information on ingredients

Information for specific product ingredients as required by the U.S. OSHA HAZARD COMMUNICATION STANDARD is listed. Refer to additional sections of this MSDS for our assessment of the potential hazards of this formulation.

**HAZARDOUS INGREDIENTS:**

Cas#	Chemical Name	Range (w/w%)
1336-21-6	AMMONIUM HYDROXIDE Corrosive; toxic (by ingestion)	30-60

### 4 First-aid measures

**SKIN CONTACT:**

URGENT! Wash thoroughly with soap and water. Remove contaminated clothing. Get immediate medical attention. Thoroughly wash clothing before reuse.

**EYE CONTACT:**

URGENT! Immediately flush eyes with plenty of low-pressure water for at least 20 minutes while removing contact lenses. Hold eyelids apart. Get immediate medical attention.

**INHALATION:**

Remove to fresh air. If breathing is difficult, give oxygen. If breathing has stopped, give artificial respiration. Get immediate medical attention.

**INGESTION:**

Do not feed anything by mouth to an unconscious or convulsive victim. Do not induce vomiting. Immediately contact physician. Dilute contents of stomach using 2-8 fluid ounces (60-240 mL) of milk or water.

**NOTES TO PHYSICIANS:**

Material is corrosive. It may not be advisable to induce vomiting. Possible mucosal damage may contraindicate the use of gastric lavage.



## 5 Fire-fighting measures

### **FIRE FIGHTING INSTRUCTIONS:**

Fire fighters should wear positive pressure self-contained breathing apparatus (full face-piece type).

### **EXTINGUISHING MEDIA:**

dry chemical, carbon dioxide, foam or water

### **HAZARDOUS DECOMPOSITION PRODUCTS:**

elemental oxides

### **FLASH POINT:**

> 200F > 93C P-M(CC)

### **MISCELLANEOUS:**

Corrosive to skin

UN 2672;Emergency Response Guide #154

## 6 Accidental release measures

### **PROTECTION AND SPILL CONTAINMENT:**

Ventilate area. Use specified protective equipment. Contain and absorb on absorbent material. Place in waste disposal container. Flush area with water. Wet area may be slippery. Spread sand/grit.

### **DISPOSAL INSTRUCTIONS:**

Water contaminated with this product may be sent to a sanitary sewer treatment facility, in accordance with any local agreement, a permitted waste treatment facility or discharged under a permit. Product as is - Incinerate or land dispose in an approved landfill.

## 7 Handling and storage

### **HANDLING:**

Alkaline. Corrosive(Skin/eyes). Do not mix with acidic material.

### **STORAGE:**

Keep containers closed when not in use. Store in cool ventilated location. Store away from oxidizers.

## 8 Exposure controls / personal protection

### **EXPOSURE LIMITS**

#### **CHEMICAL NAME**

#### **AMMONIUM HYDROXIDE**

PEL (OSHA): 50 PPM(35PPM-STEL)

TLV (ACGIH): 25 PPM(35PPM-STEL)

#### **ENGINEERING CONTROLS:**

Adequate ventilation to maintain air contaminants below exposure limits.

#### **PERSONAL PROTECTIVE EQUIPMENT:**

Use protective equipment in accordance with 29CFR 1910 Subpart I

#### **RESPIRATORY PROTECTION:**

A RESPIRATORY PROTECTION PROGRAM THAT MEETS OSHA'S 29 CFR 1910.134 AND ANSI Z88.2 REQUIREMENTS MUST BE FOLLOWED WHENEVER WORKPLACE CONDITIONS WARRANT A RESPIRATOR'S USE.

USE AIR PURIFYING RESPIRATORS WITHIN USE LIMITATIONS ASSOCIATED WITH THE EQUIPMENT OR ELSE USE SUPPLIED AIR-RESPIRATORS.

If air-purifying respirator use is appropriate, use a respirator with ammonia/methylamine cartridges.

**SKIN PROTECTION:**

gauntlet-type neoprene gloves, chemical resistant apron--  
Wash off after each use. Replace as necessary.

**EYE PROTECTION:**

splash proof chemical goggles, face shield

## 9 Physical and chemical properties

Specific Grav.(70F,21C)	0.932	Vapor Pressure (mmHG)	~ 280.0
Freeze Point (F)	-24	Vapor Density (air=1)	> 1.00
Freeze Point (C)	-31		
Viscosity(cps 70F,21C)	10	% Solubility (water)	100.0

Odor	Strong Ammonia
Appearance	Colorless To Light Yellow
Physical State	Liquid
Flash Point	P-M(CC) > 200F > 93C
pH As Is (approx.)	> 13.0
Evaporation Rate (Ether=1)	< 1.00
Percent VOC:	0.0

NA = not applicable ND = not determined

## 10 Stability and reactivity

**CHEMICAL STABILITY:**

Stable under normal storage conditions.

**POSSIBILITY OF HAZARDOUS REACTIONS:**

Contact with strong acids may cause a violent reaction releasing heat.

**INCOMPATIBILITIES:**

May react with acids.

**DECOMPOSITION PRODUCTS:**

elemental oxides

## 11 Toxicological information

Oral LD50 RAT:	350 mg/kg
Dermal LD50 RABBIT:	>1,000 mg/kg

NOTE - Estimated value

## 12 Ecological information

**AQUATIC TOXICOLOGY**

Ceriodaphnia 48 Hour Static Screen (pH adjusted)  
100% Mortality= 300; 0% Mortality= 30 mg/L  
Daphnia magna 48 Hour Static Renewal Bioassay (pH adjusted)  
LC50= 525; No Effect Level= 375 mg/L  
Fathead Minnow 96 Hour Static Renewal Bioassay (pH adjusted)  
LC50= 210; No Effect Level= 150 mg/L

**BIODEGRADATION**

Product contains only inorganics that are not subject to typical biological degradation. Assimilation by microbes may occur in waste treatment or the environment.

**13 Disposal considerations**

If this undiluted product is discarded as a waste, the US RCRA hazardous waste identification number is :  
D002=Corrosive(pH).

Please be advised; however, that state and local requirements for waste disposal may be more restrictive or otherwise different from federal regulations. Consult state and local regulations regarding the proper disposal of this material.

**14 Transport information**

DOT HAZARD: Corrosive to skin  
 PROPER SHIPPING NAME: AMMONIA SOLUTION  
 8, UN 2672, PG III, RQ  
 DOT EMERGENCY RESPONSE GUIDE #: 154

Note: Some containers may be DOT exempt, please check BOL for exact container classification

**15 Regulatory information****TSCA:**

All components of this product are included on or are in compliance with the U.S. TSCA regulations.

**CERCLA AND/OR SARA REPORTABLE QUANTITY (RQ):**

335 gallons due to AMMONIUM HYDROXIDE;

**FOOD AND DRUG ADMINISTRATION:**

ALL ingredients in this product are authorized in 21CFR173.310 for use as boiler water additives where the steam may contact food.

**NSF Registered and/or meets USDA (according to 1998 Guidelines):**

Registration number: 140720

Category Code(s):

- G5 Cooling and retort water treatment products - all food processing areas
- G6 Boiler treatment products - all food processing areas/food contact

**SARA SECTION 312 HAZARD CLASS:**

Immediate(acute);Delayed(Chronic)

**SARA SECTION 302 CHEMICALS:**

No regulated constituent present at OSHA thresholds

**SARA SECTION 313 CHEMICALS:**

CAS#	CHEMICAL NAME	RANGE
1336-21-6	AMMONIUM HYDROXIDE	31.0-40.0%

**CALIFORNIA REGULATORY INFORMATION****CALIFORNIA SAFE DRINKING WATER AND TOXIC****ENFORCEMENT ACT (PROPOSITION 65):**

No regulated constituents present

**MICHIGAN REGULATORY INFORMATION**

No regulated constituent present at OSHA thresholds

**16 Other information**

HMIS vII		CODE TRANSLATION
Health	3	Serious Hazard
Fire	0	Minimal Hazard
Reactivity	0	Minimal Hazard
Special	CORR	DOT corrosive
(1) Protective Equipment	D	Goggles,Face Shield,Gloves,Apron

(1) refer to section 8 of MSDS for additional protective equipment recommendations.

**CHANGE LOG**

	EFFECTIVE DATE	REVISIONS TO SECTION:	SUPERCEDES
MSDS status:	30-JAN-1997		** NEW **
	16-APR-1997	15	30-JAN-1997
	14-JUL-1997	15	16-APR-1997
	20-APR-1998	8	14-JUL-1997
	06-MAY-1998	;EDIT:9	20-APR-1998
	21-JAN-2000	4	06-MAY-1998
	28-FEB-2001	4,15	21-JAN-2000
	30-AUG-2001	12	28-FEB-2001
	03-FEB-2004	15	30-AUG-2001
	31-MAR-2005	16	03-FEB-2004
	07-SEP-2005	2,15	31-MAR-2005
	08-JUN-2006	8	07-SEP-2005
	17-JUN-2009	10,15	08-JUN-2006

# GE Infrastructure Water & Process Technologies

## GE Global Legionella Testing Policy

### **GE Infrastructure Water & Process Technologies *Legionella* Testing Position Statement**

GE Infrastructure Water & Process Technologies ("GE W&PT") has created a contract, referred to as the *Legionella* Testing Agreement, to provide legal protections to GE when GE W&PT representatives perform or coordinate *Legionella* testing at customer facilities. Therefore, GE W&PT's customers must sign the *Legionella* Testing Agreement before any *Legionella* testing begins.

Attachment I (Description and Scope of Services) to the *Legionella* Testing Agreement contains important information about the limitations of *Legionella* testing, sampling locations and frequencies, possible responses to a positive test result, and suggested remedial actions. The Attachment does not have to be signed by the customer, but it must be provided to the customer along with the *Legionella* Testing Agreement because the Attachment is part of the Agreement.

#### **Background Information for GE W&PT Representatives On *Legionella* Testing**

Some limited testing for *Legionella* may be prudent in order to demonstrate reasonable diligence in addressing the health risk associated with these organisms. In the event of an outbreak, testing for *Legionella* is required by US OSHA (A) and some other regulatory agencies elsewhere in the world to identify the source as well as to document that disinfection procedures were effective. Alternatively, some countries require *Legionella* testing.

#### ***Legionella* Detection Methods**

The US CDC and other experts in this area consider bacterial culture as the only reliable method for detecting live *Legionella* in water. Properly performed culturing allows for the quantitation, speciation and serotyping of important *Legionella* species. This is generally recognized as being the most sensitive method of analysis with some methods being reliable at very low levels ( i.e., 10 cfu/L (0.01 cfu/ml)).

Non-culture methods for detection of *Legionella* in cooling water include the EQUATE™ WATER Test by Binax (Portland, ME). The EQUATE kit uses an ELISA (Enzyme -Linked ImmunoSorbent Assay) to detect a carbohydrate antigen "specifically" found on the surface of *Legionella pneumophila* serogroup 1 (Lp1). The test can be done on -site and requires the filtration of 500ml to one liter of water. After sample filtration, the test takes approximately one hour to complete. The lowest detection level is approximately 200 *Legionella* per ml.

# GE Infrastructure

## Water & Process Technologies

Important issues with the Binax test include:

### False Negatives

- Detects only *Legionella pneumophila*, serogroup 1; other potentially pathogenic
- *Legionella* species are not detected; *Legionella pneumophila*, serogroup 1 at levels <200 per ml will not be detected.

### False Positives

- *Pseudomonas fluorescens*, a common cooling water contaminant, can cause a false positive result;
- Non-viable (dead) *Legionella pneumophila*, serogroup 1, give a positive result.

Additionally, the Binax EQUATE test is not quantitative. Therefore, a positive result indicates that the tested water is contaminated at a level greater than the 200 CFU/ml test cut-off but no information on the level of infestation is provided.

If the Binax EQUATE test is used, GE W&PT recommends that results be confirmed with culture testing, regardless of the result.

**NOTE: THE Binax EQUATE FIELD TEST KIT HAS BEEN WITHDRAWN FROM THE MARKET BY THE SUPPLIER.**

### Sampling for *Legionella*

For various reasons, owners and operators of cooling systems may elect to test for the presence of *Legionella* bacteria. Prior to engaging in a *Legionella* testing program, responsible individuals must have realistic expectations about the significance of the test results. Additionally these individuals should have a standardized sampling scheme, a framework for interpreting test data and an agreed upon response scheme to the test data, including the identification of persons responsible for timely reporting of results to government authorities if such reporting is required.

Attachment I to the *Legionella* Testing Agreement provide information on potential sample locations and sampling frequencies.

### Frequency of sampling

Attachment I contains information about sampling frequencies. US OSHA recommends that *Legionella* counts should be <10 CFU/ml after a successful disinfection. A return to quarterly testing may be warranted once the system is within appropriate operating standards. If positive culture results are reported, more frequent sampling may be advisable. The continuous adherence to good system maintenance and biocide application guidelines is the best overall approach to *Legionella* control.

# GE Infrastructure Water & Process Technologies

## ***Legionella* Laboratories and Sample Shipping Instructions**

Some countries require samples to be analyzed using a laboratory that has been certified or approved by the government. These government-approved laboratories must be used to analyze samples taken in such countries.

For samples taken in countries without a requirement to use government-approved laboratories, only a GE W&PT -approved laboratory may be used. Currently, GE W&PT has approved and recommends the use of the Special Pathogens Laboratory at the VA Medical Center in Pittsburgh, PA.

Samples should be collected using the GE Betz Lab Supply *Legionella* Sample Test Kit. Appropriate paperwork should be filled out completely. Incomplete information may delay receipt of results. It is important that each sample bottle is labeled so that the sample site and date are easily identifiable. The information on the bottle will correspond to the information you supply on the "*Legionella* Testing Requisition Form."

### **References:**

A. OSHA Technical Manual, Section III: Chapter 7. "Legionnaires' Disease" *Legionella* Home Page

# Legionella Testing Agreement

GE BETZ INC.  
4636 Somerton Road  
Trevose, PA 19053  
P. O. # \_\_\_\_\_

BUYER: \_\_\_\_\_

EFFECTIVE DATE: \_\_\_\_\_

## TYPE OF CONTRACT:

- Annual Contract (for scheduled, periodic Tests)  (Complete next section.)  
Open Contract (for Tests as ordered by Buyer)  (Complete next line, then skip next section.)

PRICE PER TEST:      NUMBER OF TESTS:      OPEN CONTRACT AMOUNT:  
Buyer may submit orders for additional Tests under this Agreement.

## COMPLETE FOR ANNUAL CONTRACTS

ANNUAL CONTRACT AMOUNT:

## RENEWAL/EXPIRATION

If an Annual contract, after 1 year from the Effective Date this Agreement shall automatically-  
Renew  Terminate

## TESTS and SCHEDULE:

SYSTEM	# OF TESTS PER VISIT	APPROXIMATE TEST DATES OR FREQUENCY

## ATTACHMENTS/OTHER:

Attachment I: Description and Scope of Services

GE BETZ INC. (ON BEHALF OF ITSELF AND ITS AFFILIATES WITHIN THE WATER & PROCESS TECHNOLOGIES GROUP OF COMPANIES) AGREES TO DELIVER AND BUYER AGREES TO ACCEPT THE DESCRIBED LEGIONELLA TESTS UPON ONLY THE TERMS AND CONDITIONS OF THIS AGREEMENT.

### BUYER

By:

Name:

Date:

### GE BETZ, INC.

By:

Name:

Date:



1. **Exclusive Terms and Conditions** – These Terms and Conditions, together with any proposals of GE Betz Inc. on behalf of itself and its affiliates within the Water & Process Technologies group of companies (“GE Betz”), are the exclusive contract terms between Buyer and GE Betz (“Agreement”) with respect to *legionella* tests and related services, advice and instructions (“Tests”) to be delivered or provided by GE Betz. Any alteration of or addition to this Agreement, whether oral or written, and whether contained in a purchase order or otherwise, or whether by course of performance or usage of trade shall be void and of no force and effect, unless specifically agreed to in writing signed by the parties. There are no additional or collateral agreements, representations, or warranties between the parties relating to the transaction contemplated hereby. In the case of any conflict between these Terms and Conditions and any written proposal of GE Betz, the terms of the proposal shall prevail.
2. **Scheduling of Tests** – All dates for the scheduling of Tests shall be estimates only and GE Betz shall have the right to schedule and reschedule Tests in its sole discretion. GE Betz shall not have any liability arising from its scheduling or rescheduling of Tests.
3. **Term** – If this is an Annual Contract the Term shall be for a period of 1 calendar year from the Effective Date. If this is an Open Contract, Buyer may order Tests and GE Betz may in its discretion accept or reject the order. All orders accepted shall be subject exclusively to the terms and conditions of this Agreement.
4. **Renewal** – If “renew” is marked on the reverse side, then this Agreement shall renew for a similar term (“Automatic Renewal”) without further action by either party until either party gives notice to terminate no less than 30 days before the Expiration Date.
5. **Price Increases** – In the event of Automatic Renewal GE Betz may increase prices no more often than once every 12 months after the initial Term. Buyer may terminate this Agreement by giving notice within 30 days of receiving a notice of a price increase. In the case of Open Contracts, prices shall be GE Betz’s standard per Test price in effect at the time of receipt of an order.
6. **Taxes** – Buyer shall pay all sales, use, property or gross receipts taxes imposed on the Tests.
7. **Payment** – For Annual Contracts GE Betz will invoice Buyer at the start of this Agreement and every renewal. For both Annual Contracts and Open Contracts, terms of payment are net 30 days within receipt of an invoice.
8. **Additional Tests** – Buyer agrees to pay for any additional tests requested by it at GE Betz’s standard list price per test.
9. **Warranties** – GE Betz warrants to Buyer, for a period of 12 months from the date of the performance of the Tests that the Tests shall be performed in accordance with the specifications attached, or, if none, shall conform to GE Betz’s published specifications. GE Betz shall have no liability whatsoever arising from circumstances and conditions not disclosed to GE Betz.  
  
A claim for breach of the foregoing warranties must be received by GE Betz within 12 months of the Buyer’s receipt of the Test report or the claim shall not be valid. GE Betz’s liability and Buyer’s exclusive remedy for any breach of these warranties is limited to re-performing the Tests or payment in an amount not to exceed the Contract Amount.  
  
THE FOREGOING WARRANTIES ARE IN LIEU OF AND EXCLUDE ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, AND IN NO EVENT WILL GE BETZ BE LIABLE FOR LOST PROFITS, LOST PRODUCTION, LOSS OF USE, LOSS OF VALUE, OR ANY INCIDENTAL SPECIAL OR CONSEQUENTIAL DAMAGES.
10. **Waiver** – A waiver by of strict conformance with this Agreement shall not waive any subsequent failure to conform.
11. **Force Majeure** – GE Betz shall not be liable for any failure or delay in performance due, in whole or in part, to fire, explosion, natural disaster, labor disputes, raw material shortages, act of governmental authorities, or to any cause of any nature beyond GE Betz’s control.
12. **Indemnification** – GE Betz does not agree to indemnify Buyer for any third party claims or liabilities, expenses or defense fees or costs (“Costs”) relating to the Tests. Buyer agrees to indemnify defend and hold GE Betz harmless from any and all Costs relating to the Tests. Buyer’s indemnification shall not apply, and GE Betz shall refund any amounts paid by Buyer if and when the claim or liability is finally judicially determined to have been caused by the sole negligence of GE Betz.
13. **Testimony** – In the event GE Betz is required to provide testimony regarding the Tests in any proceeding, whether, civil, criminal, administrative or otherwise, Buyer shall reimburse Self time and expenses to the extent permitted by law.
14. **Termination** – This Agreement and any order for Test may be terminated or suspended by either party on 30 days prior notice. Buyer shall not be entitled to any refund or rebate of any Contract Amount in the event of the termination of this Agreement before the end of its Term, unless the termination is by GE Betz or by Buyer due to material default GE Betz in which case Buyer shall receive a refund for a pro rata amount for any Tests not performed.
15. **Notices** – Notices shall be in writing and sent to the parties at the addresses first stated in Agreement or to any other address specified by a party from time to time by written notice and shall be effective upon receipt.

## Attachment I: Description and Scope of Services

### Background

Various studies have shown that some 40 to 60% of cooling towers tested contained *Legionella*. Routine, continuous microbiological control practices should be implemented to minimize the risk of *Legionella* amplification and associated disease. Cooling towers should be maintained so that the overall system is clean with aerobic heterotrophic bacteria counts in bulk water (planktonic) of <10,000 colony forming units per milliliter (CFU/ml) and surface (sessile) of <100,000 colony forming units per square centimeter (CFU/cm<sup>2</sup>). This can be maintained with an appropriate biocide program in conjunction with good overall water treatment.

Testing for *Legionella* can be a back-up tool to verify the effectiveness of the biocide program and the other recommended procedures for controlling microbiological growth in cooling systems. Some countries mandate *Legionella* testing.

Testing for *Legionella* is not a substitute for following standard industry recommendations for cooling system treatments to control microbiological activity. These reasons derive from difficulties in interpreting *Legionella* test results and in using test results as a basis for control. Note the following aspects:

- An infectious dose level for *Legionella* has not been established. Since no fixed "danger" level can be assigned, it also follows that no specific level of the organism can be assigned as "safe".
- *Legionella* may be present only intermittently in bulk water samples. This may result in a negative culture from a system that is contaminated with *Legionella*.
- Simple detection of the organism in a cooling system does not necessarily mean there is a risk of disease, in part because not all *Legionella* species are associated with Legionellosis.
- The one- to two-week delay between sampling and availability of test results prevents *Legionella* culture from being an effective tool for controlling water treatment programs.

### Sampling for *Legionella* Testing

For various reasons, owners and operators of cooling systems may elect to test for the presence of *Legionella* bacteria. Initially more frequent sampling of systems may be advisable. The exact frequency will depend on many factors such as water quality, system location and general monitoring/inspection results. If initial cultures are acceptable and appropriate *Legionella* control measures are in practice, quarterly sampling may be considered. In the event of an outbreak, the system should be sampled before the system is disinfected to attempt to identify the offending strain and then after the system is brought back into service after the disinfection. The system may then be sampled using the following US OSHA (A) recommended schedule:

- Weekly for the first month after return to operation
- Every two weeks for the next two months
- Monthly for the next three months

A return to quarterly testing may be warranted once the system is within appropriate operating standards.

The following sites are of primary interest in sampling an open recirculating cooling system. These are suggested areas (A) and it is left to the individual operator or owner to decide on the number of samples and sites appropriate for their system.

1. Incoming water supply to the cooling tower (make-up)
2. The cooling tower basin at a location distant from both the make-up water and hot water return (cold well, pump forebay)
3. Water that has passed through the tower fill but has not yet reached the basin
4. Storage tanks or reservoirs
5. Standing water in condensate trays or from cooling coils
6. Hot water return (return headers, open tower deck)

It is not recommended to sample biofilm or sediment. The concentration of heterotrophic bacteria in these films may hide the growth of *Legionella*, even in properly treated environmental samples.

### **Legionella Culture Results**

The laboratory will provide the following information regarding a positive culture:

- Species of *Legionella*
- Serogroup of the isolated *Legionella* species
- Concentration of isolated *Legionella* in colony forming units/milliliter (CFU/mL)

### **Potential Response to A Positive Culture Report**

There are no guidelines that establish a relationship between numbers of *Legionella* isolated in a culture and the risk of infection. It is also important to note that in many countries there are no current government regulations concerning permissible numbers of *Legionella* in water systems. However, there has been enough consensus amongst experts to suggest a plan for remedial action in case of *Legionella* being isolated from a water system. The guidelines in Tables 1 and 2 are from: Reducing Risks Associated with *Legionella* Bacteria in Building Water Systems, by B.G. Shelton, G.K. Morris and G.W. Borman, in "*Legionella*, Current Status and Emerging Perspectives," ASM Press, 1993. If the water system is located in a country/province/state that has regulations or guidance regarding the permissible numbers of *Legionella* or requirements relating to the type of corrective action that must be performed, then such requirements must be followed.

**Table 1: Suggested Remedial Action Criteria for *Legionella***

Remedial Action<sup>a</sup> if Detected in:

<i>Legionellae</i> /mL	Cooling Towers and Evaporative Condensers	Potable Water	Humidifier/Fogger
Detectable, but <1	1	2	3
1 to 9	2	3	4
10 to 99	3	4	5
100 to 999	4	5	5
> 1,000	5	5	5

<sup>a</sup> Suggested remedial action, see Table 2.

**Table 2: Remedial Actions**

Hazard Level	Actions
1	Review routine maintenance program recommended by the manufacturer of the equipment to ensure that the recommended program is being followed. The presence of barely detectable numbers of <i>Legionellae</i> represents a low level of concern.
2	Implement Action 1. Conduct the follow up analysis after a few weeks for evidence of further <i>Legionella</i> amplification. This level of <i>Legionellae</i> represents little concern, but the number of organisms detected indicates that the system is a potential amplifier for <i>Legionellae</i> .
3	Implement Action 2. Conduct review of premises for direct and indirect bioaerosol contact with occupants and health risk status of people who may come in contact with the bioaerosols. Depending on the results of the review of the premises, action related to cleaning and/or biocide treatment of the equipment may be indicated. This level of <i>Legionellae</i> represents a low but increased level of [concern].
4	Implement Action 3. Cleaning and/or biocide treatment of the equipment is indicated. This level of <i>Legionellae</i> represents a moderately high level of concern, since it is approaching levels that may cause outbreaks. It is uncommon for samples to contain numbers of <i>Legionellae</i> that fall in this category.
5	Immediate cleaning and/or biocide treatment of the equipment is definitely indicated. Conduct post-treatment analysis to ensure effectiveness of the corrective action. The level of <i>Legionella e</i> represents a high level of concern since it poses the potential for causing an outbreak. It is very uncommon for samples to contain numbers of <i>Legionellae</i> that fall in this category.

References:

A. OSHA Technical Manual, Section III: Chapter 7. "Legionnaires' Disease"