**RETURN BIDS TO:**
**RETOURNER LES SOUMISSIONS À:**

**Bid Receiving - PWGSC / Réception des soumissions - TPSGC**
**11 Laurier St. / 11, rue Laurier**
**Place du Portage, Phase III**
**Core 0A1 / Noyau 0A1**
**Gatineau, Québec K1A 0S5**
**Bid Fax: (819) 997-9776**

# REQUEST FOR PROPOSAL
# DEMANDE DE PROPOSITION

**Proposal To: Public Works and Government Services Canada**

We hereby offer to sell to Her Majesty the Queen in right of Canada, in accordance with the terms and conditions set out herein, referred to herein or attached hereto, the goods, services, and construction listed herein and on any attached sheets at the price(s) set out therefor.

**Proposition aux: Travaux Publics et Services Gouvernementaux Canada**

Nous offrons par la présente de vendre à Sa Majesté la Reine du chef du Canada, aux conditions énoncées ou incluses par référence dans la présente et aux annexes ci-jointes, les biens, services et construction énumérés ici sur toute feuille ci-annexée, au(x) prix indiqué(s).

**Comments - Commentaires**

| | |
|---|---|
| **Title - Sujet**<br>100kN TENSILE TESTING SYSTEM | |
| **Solicitation No. - N° de l'invitation**<br>W8486-140307/A | **Date**<br>2013-12-02 |
| **Client Reference No. - N° de référence du client**<br>W8486-140307 | |
| **GETS Reference No. - N° de référence de SEAG**<br>PW-$$HN-442-64032 | |
| **File No. - N° de dossier**<br>hn442.W8486-140307 | **CCC No./N° CCC - FMS No./N° VME** |
| **Solicitation Closes - L'invitation prend fin**<br>**at - à 02:00 PM**<br>**on - le 2014-01-14** | **Time Zone**<br>**Fuseau horaire**<br>Eastern Standard Time EST |
| **F.O.B. - F.A.B.**<br>**Plant-Usine:** ☐ **Destination:** ☑ **Other-Autre:** ☐ | |
| **Address Enquiries to: - Adresser toutes questions à:**<br>Hamel, Jean-Yves | **Buyer Id - Id de l'acheteur**<br>hn442 |
| **Telephone No. - N° de téléphone**<br>(819) 956-8278 ( ) | **FAX No. - N° de FAX**<br>( ) - |
| **Destination - of Goods, Services, and Construction:**<br>**Destination - des biens, services et construction:**<br>Specified Herein<br>Précisé dans les présentes | |

**Instructions: See Herein**

**Instructions: Voir aux présentes**

**Vendor/Firm Name and Address**
**Raison sociale et adresse du fournisseur/de l'entrepreneur**

| | |
|---|---|
| **Delivery Required - Livraison exigée**<br>See Herein | **Delivery Offered - Livraison proposée** |
| **Vendor/Firm Name and Address**<br>**Raison sociale et adresse du fournisseur/de l'entrepreneur**<br><br>**Telephone No. - N° de téléphone**<br>**Facsimile No. - N° de télécopieur** | |
| **Name and title of person authorized to sign on behalf of Vendor/Firm (type or print)**<br>**Nom et titre de la personne autorisée à signer au nom du fournisseur/ de l'entrepreneur (taper ou écrire en caractères d'imprimerie)**<br><br>**Signature** **Date** | |

**Issuing Office - Bureau de distribution**

Electrical & Electronics Products Division
11 Laurier St./11, rue Laurier
6B1, Place du Portage, Phase III
Gatineau, Québec K1A 0S5

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## PART 1 - GENERAL INFORMATION

### 1. Security Requirement

There is no security requirement associated with the requirement.

### 2. Requirement

The contractor must provide the goods and/or services in accordance with the technical requirements and in the quantities stated herein at **Annex A - Statement of Requirement**.

This requirement includes one (1) Instron Model 1125 100kN Tensile Test Machine (Serial # 4400-C10260) as a trade-in.

### 2.1 Delivery Requirement

Delivery is requested to be completed by 31 March 2014.

### 3. Debriefings

Bidders may request a debriefing on the results of the bid solicitation process. Bidders should make the request to the Contracting Authority within 15 working days of receipt of the results of the bid solicitation process. The debriefing may be in writing, by telephone or in person.

## PART 2 - BIDDER INSTRUCTIONS

### 1. Standard Instructions, Clauses and Conditions

All instructions, clauses and conditions identified in the bid solicitation by number, date and title are set out in the *Standard Acquisition Clauses and Conditions Manual* (https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual) issued by Public Works and Government Services Canada.

Bidders who submit a bid agree to be bound by the instructions, clauses and conditions of the bid solicitation and accept the clauses and conditions of the resulting contract.

The 2003 (2013-06-01) Standard Instructions - Goods or Services - Competitive Requirements, are incorporated by reference into and form part of the bid solicitation.

Subsection 5.4 of 2003, Standard Instructions - Goods or Services - Competitive Requirements, is amended as follows:

Delete: sixty (60) days

Insert: ninety (90) days

### 1.1 SACC Manual Clauses

| SACC Reference | Section | Date |
|---|---|---|
| A9033T | Financial Capability | 2012-07-16 |
| B1000T | Condition of Material | 2007-11-30 |

### 2. Submission of Bids

Bids must be submitted only to Public Works and Government Services Canada (PWGSC) Bid Receiving Unit by the date, time and place indicated on page 1 of the bid solicitation.

## 3. Enquiries - Bid Solicitation

All enquiries must be submitted in writing to the Contracting Authority no later than seven (7) calendar days before the bid closing date. Enquiries received after that time may not be answered.

Bidders should reference as accurately as possible the numbered item of the bid solicitation to which the enquiry relates. Care should be taken by bidders to explain each question in sufficient detail in order to enable Canada to provide an accurate answer. Technical enquiries that are of a proprietary nature must be clearly marked "proprietary" at each relevant item. Items identified as "proprietary" will be treated as such except where Canada determines that the enquiry is not of a proprietary nature. Canada may edit the questions or may request that the Bidder do so, so that the proprietary nature of the question is eliminated, and the enquiry can be answered with copies to all bidders. Enquiries not submitted in a form that can be distributed to all bidders may not be answered by Canada.

## 4. Applicable Laws

Any resulting contract must be interpreted and governed, and the relations between the parties determined, by the laws in force in Ontario.

Bidders may, at their discretion, substitute the applicable laws of a Canadian province or territory of their choice without affecting the validity of their bid, by deleting the name of the Canadian province or territory specified and inserting the name of the Canadian province or territory of their choice. If no change is made, it acknowledges that the applicable laws specified are acceptable to the bidders.

## 5. Improvement of Requirement During Solicitation Period

Should the bidder consider that the specifications or Statement of Work contained in the bid solicitation could be improved technically or technologically, bidders are invited to make suggestions, in writing, to the Contracting Authority named in the bid solicitation. Bidders must clearly outline the suggested improvement as well as the reason for the suggestion. Suggestions that do not restrict the level of competition nor favour a particular bidder will be given consideration provided they are submitted to the Contracting Authority at least seven (7) calendar days before the bid closing date. Canada will have the right to accept or reject any or all suggestions**.**

## PART 3 - BID PREPARATION INSTRUCTIONS

### 1. Bid Preparation Instructions

Canada requests that bidders provide their bid in separately bound sections as follows:

| | | |
|---|---|---|
| Section I: | Technical Bid | (Two (2) hard copies) |
| Section II: | Financial Bid | (One (1) hard copy) |
| Section III: | Certifications | (One (1) hard copy) |
| Section IV: | Additional Information | (One (1) hard copy) |

Prices should appear in the financial bid only. No prices should be indicated in any other section of the bid.

Canada requests that bidders follow the format instructions described below in the preparation of their bid:

(a) use 8.5 x 11 inch (216 mm x 279 mm) paper;
(b) use a numbering system that corresponds to the bid solicitation.

In April 2006, Canada issued a policy directing federal departments and agencies to take the necessary steps to incorporate environmental considerations into the procurement process Policy on Green Procurement (http://www.tpsgc-pwgsc.gc.ca/ecologisation-greening/achats-procurement/politique-policy-eng.html). To assist Canada in reaching its objectives, bidders are encouraged to:

1) use paper containing fibre certified as originating from a sustainably-managed forest and/or containing minimum 30% recycled content; and

2) use an environmentally-preferable format including black and white printing instead of colour printing, printing double sided/duplex, using staples or clips instead of cerlox, duotangs or binders.

### Section I: Technical Bid (Two (2) hard copies)

In their technical bid, bidders should explain and demonstrate how they propose to meet the requirements and how they will carry out the Work.

## 1.1 Equivalent Products

1. Products that are equivalent in form, fit, function and quality to the item(s) specified in the bid solicitation will be considered where the Bidder:

   (a) designates the brand name, model and/or part number of the substitute product;

   (b) states that the substitute product is fully interchangeable with the item specified;

   (c) provides complete specifications and descriptive literature for each substitute product with the bid;

   (d) provides compliance statements that include technical specifics showing the substitute product meets all mandatory performance criteria that are specified in the bid solicitation; and

   (e) clearly identifies those areas in the specifications and descriptive literature that support the substitute product's compliance with any mandatory performance criteria.

2. Products offered as equivalent in form, fit, function and quality will not be considered if:

   (a) the bid fails to provide all the information requested to allow the Contracting Authority to fully evaluate the equivalency of each substitute product; or

   (b) the substitute product fails to meet or exceed the mandatory performance criteria specified in the bid solicitation for that item.

3. In conducting its evaluation of the bids, Canada may, but will have no obligation to, request bidders offering a substitute product to demonstrate, at the sole cost of bidders, that the substitute product is equivalent to the item specified in the bid solicitation.

**Section II: Financial Bid (One (1) hard copy)**

Bidders must submit their financial bid in accordance with the Basis of Payment. The total amount of Applicable Taxes must be shown separately.

## 1.2 Exchange Rate Fluctuation

The requirement does not offer exchange rate fluctuation risk mitigation. Requests for exchange rate fluctuation risk mitigation will not be considered. All bids including such provision will render the bid non-responsive.

**Section III: Certifications (One (1) hard copy)**

### 1.3 Certifications

Bidders must submit the certifications required under Part 5.

**Section IV: Additional Information (One (1) hard copy)**

### 1.4 Additional Information

#### 1.4.1 Delivery Proposed

While delivery is requested as indicated above, the best delivery/installation/removal of the Tensile Testing Machines that could be offered should be indicated in **Annex B - Pricing and Delivery**.

#### 1.4.2 Contractor Representatives

Name and telephone number of the person responsible for :

**General enquiries**

Name: _____
Telephone: _____
Facsimile: _____
E-mail: _____

**Delivery follow-up**

Name: _____
Telephone: _____
Facsimile: _____
E-mail: _____

### 1.4.3 After Sales Service

Canada requests that the Bidder provides the names, addresses and telephone numbers of their dealers and/or agents authorized to provide after sales service, maintenance and warranty repairs, and a full range of repair parts for the equipment offered. The Bidder should show the distance between the delivery location and the authorized dealer and/or agent and the delivery location, which should not be more than 100 kilometres.

Distance between the delivery location and the dealer and/or agent: _____ km

Name: _____
Address: _____
Telephone: _____

### 1.4.4 Annex C - Compliance Grid

Bidders are requested to submit the attached **Annex C - Compliance Grid** completed in order to facilitate the evaluation of any equivalent item proposed.

## PART 4 - EVALUATION PROCEDURES AND BASIS OF SELECTION

### 1. Evaluation Procedures

(a) Bids will be assessed in accordance with the entire requirement of the bid solicitation including the technical and financial evaluation criteria.

(b) An evaluation team composed of representatives of Canada will evaluate the bids.

**Evaluation Criteria**

All bids must be completed in full and provide all of the information requested in the bid solicitation to enable full and complete evaluation.

### 1.1 Technical Evaluation

#### 1.1.1 Mandatory Technical Criteria

The following Mandatory requirements must be submitted with the bid for evaluation

Technical compliance (description of items from **Annex A - Statement of Requirement** herein).

### 1.2 Financial Evaluation

The Bid price will be determined by processing items at **Annex B - Pricing and Delivery** as follows:

#### 1.2.1 Pricing Basis

The bidder must quote firm unit prices in Canadian dollars, DDP Delivered Duty Paid (destination), Applicable Taxes extra, as applicable. Freight charges to destination and all applicable Custom duties and Excise taxes must be included.

### 2. Basis of Selection

A bid must comply with the requirements of the bid solicitation and meet all mandatory technical evaluation criteria to be declared responsive. The responsive bid with the lowest evaluated price on an aggregate basis (Less items 006, 007 and 008) will be recommended for award of a contract.

## PART 5 - CERTIFICATIONS

Bidders must provide the required certifications and documentation to be awarded a contract.

The certifications provided by bidders to Canada are subject to verification by Canada at all times. Canada will declare a bid non-responsive, or will declare a contractor in default, if any certification made by the Bidder is found to be untrue whether during the bid evaluation period or during the contract period.

The Contracting Authority will have the right to ask for additional information to verify the Bidder's certifications. Failure to comply with this request will also render the bid non-responsive or will constitute a default under the Contract.

### 1. Mandatory Certifications Required Precedent to Contract Award

### 1.1 Code of Conduct and Certifications - Related documentation

By submitting a bid, the Bidder certifies that the Bidder and its affiliates are in compliance with the provisions as stated in Section 01 Code of Conduct and Certifications - Bid of Standard Instructions 2003. The related documentation therein required will assist Canada in confirming that the certifications are true.

### 1.2 Federal Contractors Program for Employment Equity - Bid Certification

By submitting a bid, the Bidder certifies that the Bidder, and any of the Bidder's members if the Bidder is a Joint Venture, is not named on the Federal Contractors Program (FCP) for employment equity "FCP Limited Eligibility to Bid" list (http://www.labour.gc.ca/eng/standards_equity/eq/emp/fcp/list/inelig.shtml) available from Human Resources and Skills Development Canada (HRSDC) - Labour's website.

Canada will have the right to declare a bid non-responsive if the Bidder, or any member of the Bidder if the Bidder is a Joint Venture, appears on the "FCP Limited Eligibility to Bid " list at the time of contract award.

## PART 6 - RESULTING CONTRACT CLAUSES

### 1. Security Requirement

There is no security requirement associated with the requirement.

### 2. Requirement

The contractor must provide the goods and/or services in accordance with the technical requirements and in the quantities stated herein at **Annex A - Statement of Requirement**.

The contractor must also take away one (1) Instron Model 1125 100kN Tensile Test Machine (Serial # 4400-C10260) as a trade-in.

### 2.1 SACC Manual Clauses

| SACC Reference | Section | Date |
|---|---|---|
| B1501C | Electrical Equipment | 2006-06-16 |
| B4019C | United States Military Specifications and Standards | 2007-11-30 |
| B7500C | Excess Goods | 2006-06-16 |

### 2.2 Optional Goods and/or Services (Items 006 to 008)

The Contractor grants to Canada the irrevocable option to acquire the goods, services or both described at **Annex B - Pricing and Delivery** of the Contract under the same conditions and at the prices stated in the Contract. The option may only be exercised by the Contracting Authority and will be evidenced, for administrative purposes only, in whole or in part, through a contract amendment.

The Contracting Authority may exercise the option to acquire any or all of items 006 to 008 within twelve (12) months after contract award by sending a written notice to the Contractor.

### 3. Standard Clauses and Conditions

All clauses and conditions identified in the Contract by number, date and title are set out in the *Standard Acquisition Clauses and Conditions Manual* (https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual) issued by Public Works and Government Services Canada.

### 3.1 General Conditions

2010A (2013-04-25), General Conditions - Goods (Medium Complexity), and sections 05, 06, 16, 20 and 28 of 2010C (2013-06-27), General Conditions - Services (Medium Complexity) apply to and form part of the Contract.

### 3.3 SACC Manual Clauses

| SACC Reference | Section | Date |
|---|---|---|
| C2800C | Priority Rating | 2011-05-16 |
| C2801C | Priority Rating - Canadian Contractors | 2011-05-16 |

## 4. Term of Contract

### 4.1 Delivery Date

All the deliverables must be received on or before _____ (Delivery as offered and as accepted will be inserted at contract award).

## 5. Authorities

### 5.1 Contracting Authority

The Contracting Authority for the Contract is:

**Jean-Yves Hamel**
**Supply Officer**
Public Works and Government Services Canada
Acquisitions Branch
Logistics, Electrical, Fuel and Transportation Directorate
"HN" Division
7B3, Place du Portage, Phase III
11 Laurier Street
Gatineau, QC, K1A 0S5
Telephone : (819) 956-8278
Facsimile : (819) 953-4944
E-mail : JeanYves.Hamel@pwgsc-tpsgc.gc.ca

The Contracting Authority is responsible for the management of the Contract and any changes to the Contract must be authorized in writing by the Contracting Authority. The Contractor must not perform work in excess of or outside the scope of the Contract based on verbal or written requests or instructions from anybody other than the Contracting Authority.

## 5.2 Technical Authority

The Technical Authority for the Contract is:

Name: will be inserted at contract
Title: will be inserted at contract
Telephone: will be inserted at contract
Facsimile: will be inserted at contract
E-mail: will be inserted at contract

The Technical Authority named above is the representative of the department or agency for whom the Work is being carried out under the Contract and is responsible for all matters concerning the technical content of the Work under the Contract. Technical matters may be discussed with the Technical Authority, however the Technical Authority has no authority to authorize changes to the scope of the Work. Changes to the scope of the Work can only be made through a contract amendment issued by the Contracting Authority.

## 5.3 Contractor's Representative

Name and telephone number of the person responsible for:

**General Enquiries**

Name: will be inserted at contract
Telephone: will be inserted at contract
Facsimile: will be inserted at contract
E-mail: will be inserted at contract

**Delivery Follow-up**

Name: will be inserted at contract
Telephone: will be inserted at contract
Facsimile: will be inserted at contract
E-mail: will be inserted at contract

## 6. Payment

### 6.1 Basis of Payment

In consideration of the Contractor satisfactorily completing all of its obligations under the Contract, the Contractor will be paid firm unit prices as specified in the contract. Customs duties are included and Applicable Taxes are extra.

Canada will not pay the Contractor for any design changes, modifications or interpretations of the Work, unless they have been approved, in writing, by the Contracting Authority before their incorporation into the Work.

### 6.2 Limitation of Price

SACC Manual clause C6000C (2011-05-16) Limitation of Price

### 6.3 Multiple Payments

SACC Manual clause H1001C (2008-05-12) Multiple Payments

### 6.4 Trade-in

The Instron Model 1125 to be traded in will be retained by Canada until exchanged for the new Vertical Machining Centre. No adjustment will be made to the trade-in allowance to allow for depreciation arising out of normal wear and tear on the used Instron Model 1125 between the time of its appraisal and the time the used Instron Model 1125 is exchanged. The Contractor must, immediately upon taking possession of the used Instron Model 1125, report in writing any significant change in the condition of the used Instron Model 1125 to the Contracting Authority.

### 6.5 SACC Manual Clauses

| SACC Reference | Section | Date |
|---|---|---|
| C2611C | Customs Duties - Contractor Importer | 2007-11-30 |
| D0050C | End User Certificate | 2007-05-25 |
| G1005C | Insurance | 2008-05-12 |

## 7. Invoicing Instructions

1. The Contractor must submit invoices in accordance with the section entitled "Invoice Submission" of the general conditions. Invoices cannot be submitted until all work identified in the invoice is completed.

2. Invoices must be distributed as follows:

   (a) one (1) copy must be forwarded to the consignee.

   (b) The original and one (1) copy must be forwarded to the following address for certification and payment.

   National Defence Headquarters
   MGen George R. Pearkes Building
   101 Colonel By Drive
   Ottawa, ON, K1A 0K2
   Attention: will be inserted at contract

   (c) One (1) copy must be forwarded to the Contracting Authority identified under the section entitled "Authorities" of the Contract.

   Department of Public Works and Government Services
   "HN" Division
   7B3 Place du Portage, Phase III
   11 Laurier Street
   Gatineau, QC
   K1A 0S5
   Attention: Jean-Yves Hamel

## 8. Certifications

### 8.1 Compliance

Compliance with the certifications provided by the Contractor in its bid is a condition of the Contract and subject to verification by Canada during the term of the Contract. If the Contractor does not comply with any certification or it is determined that any certification made by the Contractor in its bid is untrue, whether made knowingly or unknowingly, Canada has the right, pursuant to the default provision of the Contract, to terminate the Contract for default.

## 9. Applicable Laws

The Contract must be interpreted and governed, and the relations between the parties determined, by the laws in force in will be inserted at contract.

## 10. Priority of Documents

If there is a discrepancy between the wording of any documents that appear on the list, the wording of the document that first appears on the list has priority over the wording of any document that subsequently appears on the list.

(a) the Articles of Agreement;
(b) 2010A (2013-04-25) General Conditions - Goods (Medium Complexity);
(c) 2010C (2013-06-27) General Conditions - Services (Medium Complexity);
(d) **Annex B - Pricing and Delivery**;
(e) **Annex A - Statement of Requirement**;
(f) the Contractor's bid dated will be inserted at contract

## 11. Defence Contract

SACC Manual clause A9006C (2012-07-16) Defence Contract

## 12. SACC Manual Clauses

| SACC Reference | Section | Date |
|---|---|---|
| D5545C | ISO 9001:2008 - Quality Management Systems - Requirements (QAC C) | 2010-08-16 |

## 13. SACC Manual Clauses (Delivery)

| SACC Reference | Section | Date |
|---|---|---|
| D2000C | Marking | 2007-11-30 |
| D2001C | Labelling | 2007-11-30 |
| D6010C | Palletization | 2007-11-30 |
| D2025C | Wood Packaging Materials | 2013-11-06 |
| D9002C | Incomplete Assemblies | 2007-11-30 |

### 13.1 Shipping Instructions - Delivery at Destination

Goods must be consigned to the destination specified in the Contract and delivered:

Delivered Duty Paid (DDP) (Gatineau, Québec) Incoterms 2000 for shipments from a commercial contractor.

### 13.2 Shipping - Scheduling

The contractor must deliver and install the goods to Gatineau, Québec at the address below:

QETE - Quality Engineering Test Establishment
National Printing Bureau Building
45 Sacré-Coeur Blvd
Gatineau, Québec
J8X 1C6
Phone: will be inserted at contract

### 14. Inspection and Acceptance

The Technical Authority is the Inspection Authority. All reports, deliverable items, documents, goods and all services rendered under the Contract are subject to inspection by the Inspection Authority or representative. Should any report, document, good or service not be in accordance with the requirements of **Annex A - Statement of Requirement** and to the satisfaction of the Inspection Authority, as submitted, the Inspection Authority will have the right to reject it or require its correction at the sole expense of the Contractor before recommending payment.

### 15. After Sales Service

Name: _____
Address: _____
Telephone number: _____

This after sales service must be available during normal business hours, Monday to Friday between 08:00 to 16:00 EST. Response time for on site technical support should not exceed two (2) business days following request. Any repairs should be completed within thirty (30) calendar days.

# Annex A - Statement of Requirement

## 100kN Tensile Testing Machine

## 1.0 SCOPE/BACKGROUND

This 100kN Tensile Testing Machine will handle the majority of the tensile and compression testing done in the material's lab. The 100kN system's main function is for material characterization purposes but it is also used for specialized tensile and compression testing and to expose fracture faces of cracked military equipment and weapon system platform components. Some of the specialized tests incorporate large fixtures and/or involves testing of large unwieldy specimens. This machine will be used in conjunction with QETE's existing supply of grips, fixtures and extensometers that are configured for use with Instron systems.

## 2.0 REQUIREMENTS

### 2.1 General:

**Item 001** - The 100kN Tensile Testing Machine is expected to be a dual column floor mounted electromechanical testing system. The Instron Model 5985-E2-F2, modified as described below, will satisfy this requirement. Any other tensile system that is equivalent to the system described below is acceptable and will be evaluated. The unit must be capable of tension, compression, flexure, shear, and reverse stress testing with digital control and data acquisition electronics including crosshead extension and load measurement channels. The supplied Tensile Testing Machine must include user manuals, maintenance manuals and calibration manuals in hard copy and searchable electronic version - both in English at a minimum. In addition, the unit must meet the following minimum criteria requirements listed below.

### 2.2 Mandatory Trade in:

**Item 002** - This requirement includes a trade-in consisting of the disassembly and removal of a serviceable 35 year old 100kN Tensile Testing Machine. See attached pictures. The unit is an Instron Model 1125, with extended height design. The machine is 30 inches between the columns, 9 feet between the bottom of the crosshead (at its highest position) and the top of the base platen. The overall height is 12.5 feet and the overall maximum width is 4 feet (at the base). The controlling unit is an Instron 3300 controller A604-200. The controlling software is Bluehill2 version 2.16.635. The unit includes a Dell precision 390 computer, Intel Duo core. and an HP4240n LaserJet printer workstation.

## 2.3 Mandatory Frame Requirements:

a. Testing speed range: 0.00005 to 1016 mm/min (0.000002 in/min to 40 in/min);

b. Crosshead return speed: 1016 mm/min (40 in/min);

c. At least 0.9 metres space between the columns; There is no width restriction at the base of the machine however the machine cannot be wider than 58 inches at the top of the machine (above 114 inches from the floor)

d. Frame that is rated to a minimum of 100kN;

e. 100kN load cell (minimum acceptable);

f. At least 10.3 feet of working space between top of base platen to the bottom of the crosshead. The maximum height of the machine is limited by the ceiling height, which is 14 feet, 11 inches;

g. The load frame must include at least two (2) 80 mm diameter smooth ground guidance rods for the moving crosshead;

h. The load frame must include a CSA (or equivalent) approved emergency stop switch. The system must not restart the crosshead moving when the emergency stop button is released. The emergency stop switch will remain active when covers are removed for service;

i. The frame must include adjustable dual level mechanical limit switches that prevent the crosshead from traveling too high or too low. The first level switch must stop the crosshead, but maintain power to the system. The second level limit switch must cut the power to the frame in case the first level switch malfunctions;

j. The frame must include an attachment mechanism (such as integrated T-slots) on the front and back of both column covers for easy mounting of accessories;

k. The frame must have a clearly labeled buttons to jog the crosshead UP or DOWN. When released, the crosshead must stop; and

l. The frame must include an operator panel which can be used to run and stop tests at the frame as opposed to through the PC and software. The operator panel must have at least two (2) live display read outs that are in synch with the testing software live displays as well as at least two (2) shortcut keys that can be used to carry out functions such as balancing load, strain or marking data. The operator panel must also have a fine position wheel that can be used to move the frame crosshead in small increments to aid in the installation and removal of fixtures.

## 2.4 Mandatory Software Requirements:

a. The control software must be a true graphical user interface compatible with Microsoft Windows 7;

b. The software must have three levels of user access based on his or her login name and include password protection;

c. The software must allow the user to assign at least two (2) soft keys displayed on the monitor to provide quick access to functionality such as: balance load, balance strain, reset gauge length and exclude specimen at a minimum;

d. The testing software must be able to perform tensile, compression, flexure, peel, tear, friction, stress relaxation, creep and simple cyclic tests and include an appropriate calculation list for each type of test at a minimum;

e. The testing software must be able to perform cyclic testing defined by blocks that can be customized by the user and include: relative ramps, absolute ramps, triangle waveforms and hold patterns at a minimum;

f. The software must allow for load and strain control of the test system;

g. The control software must include set-up of the following: test speed, limits on all channels, calibration and balance of transducers, specimen dimensions, and results tables at a minimum;

h. The software must allow the user to be prompted during testing and provide a mechanism for the user to select audio, images or video clips to be included in the prompt area when running tests;

i. The software must allow the user to specify the test control area - above or below the moving crosshead;

j. The software must allow the user to enable a specimen protection safety feature and set a load threshold to prevent damage during gripping and specimen preload;

k. The software must allow the user (when configuring a test method) the option to select auto-balance load and/or strain channels before the start of the test;

l. The software must allow the user (when configuring a test method) the option to select pre-load or pre-cycle a specimen before the start of a test;

m. The software must allow the user to configure a test method to automatically detect a specimen break by a change in rate of load or a percentage drop of the maximum load;

n. The software must have the option available to allow for automatic return of the crosshead to the test start position after specimen break is detected and also to be able to select a specimen protect feature;

o. The software must allow the user to enable an audio alert defined by a load threshold value;

p. The control software must be capable of acquiring data at 1000 Hz across load, displacement, and up to two (2) additional strain channels that can be utilised on an optional basis. Data rates must not be affected by the number of strain channels collected;

q. Test control software must be able to automatically store raw data or calculated results in an ASCII file;

r. The software must have the option to integrate any USB camera device (such as a Webcam) for video capture of the entire tested specimen and allow for playback of the test with data point selection matching with video frames for analysis;

s. The software must offer the following calculations:

- Maximum Peak (all available channels)
- Minimum Peak (all available channels)
- Specimen Break Point (all available channels)
- Yield (Zero slope, Offset and Energy at Yield)
- Modulus (Secant, Tangent, Automatic Young's, User-defined Young's, Chord)
- Slope (Secant, Tangent, Automatic Young's, User-defined Young's, Chord)
- Average Load Between two (2) Points based on average load, number of peaks, number of troughs, number of peaks and troughs
- Total creep & delta creep
- Total relaxation & delta relaxation
- Seam slippage
- Area reduction
- Coefficient of friction (static & dynamic)
- Local peak
- Poisson's ratio
- n-value, r-value & YPE & non-proportional elongation

t. The software must include the capability to define correction factors such as: machine compliance, slack, pretension, load and gauge length at a minimum;

u. The software must provide CSV raw data output;

v. The software must provide the option of storing test reports in one of three (3) formats: MS Word, HTML or PDF;

w. The software must provide a mechanism for editing of the report template including the header, footer and body. The body of the report must be completely customizable with pictures and text and allow for import of test results and graphs. The report editor must be integrated with the software to allow for instant update of the report content when each test is run.

## 2.5 Mandatory Performance:

a. Load cell and extensometer transducers available for the system must include self-identification (recognition) electronics in the connector directly attached to these transducers which automates the calibration of these devices. For safety and data integrity issues, operators must not have to select the capacity of a load cell from a list or type in a value in order to calibrate different load cells (or extensometers). Manually calibrated load cells or extensometers requiring calibration weights or calibration micrometer fixture are not acceptable. In addition to the above, the system must allow for manual calibration of third party transducers;

b. The load weighing system accuracy must be within +/-0.5% of reading down to $1/1000^{th}$ of the load cell capacity;

c. Any load cell provided must have 105% over range protection that will stop the frame automatically. For safety purposes, the maximum load for a test should be set by identification electronics located in the connector directly attached to the load cell. Operators must not have to select the capacity of a load cell from a list or type in a value in order to calibrate different load cells. Because this identification connector automatically sets the maximum load for a test, this connector must not be detachable from the load cell to prevent it to be used with a different capacity load cells;

d. The tension/compression load cell must have an overload capacity without permanent zero shift of 150% of capacity;

e. The system must include an integrated context sensitive help and reference system. The help screen must demonstrate both how a function works and why it is used. The search capability must allow the user to find a specific topic from the help index or by cross-referencing information from another help topic. The system will not be connected to the internet so all help functions, topics, definition, etc must be contained within the software and not rely on internet access.

f. Digital displays on the computer monitor should show live load, displacement, and optional strain values in engineering units that can be selected to be Metric, S.I., U.S. customary. For safety purposes, these live displays should not be allowed to be covered up or hidden during a test or while jogging the crosshead. Up to four (4) live display windows must be available for display simultaneously;

g. An unlimited number of test methods must be available for storage and retrieval;

h. Run time screen must be capable of displaying both the real time graph and the calculated results of multiple specimens simultaneously;

i. Data must be acquired at a user selectable, continuous rate without gaps;

j. Specimen geometry's for each specimen must include rectangular, irregular (area), cube, cylindrical, 3- and 4-point bend specimens, 90-, 180- and T-peel test geometries and geometries for tear specimens and coefficient of friction tests at a minimum;

k. A real time X-Y plot of two (2) selected variables will be displayed. The variables available for selection for each axis will be load, stress, extension, and either of the two (2) strain channels as selected by the user. The available system of units for each axis will be US Customary, Metric, or SI and will be independently set by the user. Other graph features will include manual and automatic scaling, legend symbols, to distinguish individual test curves, horizontal and vertical offset between test curves, double-Y axis, multi-channel, and selectable number of test curves per display at a minimum;

l. The ability to re-analyze past test data using different calculations (as stated in 2.4 s.) must be provided;

m. USB camera device (such as a webcam) as described in section 2.4 r., must come with an attachment to mount to the frame;

n. The load measurement accuracy must at least 0.5% of the reading down to 1/1000th of a load the cell's capacity;

o. **Item 003 -** Workstation comprising of the following:

- One (1) High Performance Workstation PC which meets or exceeds the following components: Intel Quad Core Xeon E5507 2.26 GHZ Processor
- 2 Ethernet ports (1 on motherboard and 1 on a PCI card)
- 1 GB DDR2 SDRAM
- 80 GB SATA Hard Drive
- 16 X DVD +/- RW, Data only
- nVidia NVS 290, 256 Mb Dual DVI graphics card
- Internal Chassis Speakers
- Expansion Slots: Two 13.4" and one 5.75" length, full height PCI slots.
- One serial port and one parallel port
- Minitower Chassis
- USB Enhanced Multimedia Keyboard
- USB Two Button Optical Mouse with Scroll
- RoHS Compliant Lead Free Chassis and Motherboard
- Accessories: One (1) 24 inch Flat Panel LCD Monitor and one (1) Color DeskJet Printer - HP940C (Or equivalent);

p. The system must be compatible with existing supply of grips, fixtures and extensometers that are configured for use with Instron systems including;

   a. Wedge Action Grips, Capacity: 20,000 lb. Temperature range: -150 °C to 250 °C (-240 °F to 480 °F). Specimen Range: - Flats: 0 to .5 inches x 2 inches wide - Rounds: 1/8$^{th}$ to 3/4 inch diameter, grip length: 2.25 inches. Upper and lower fittings: Type Dm. (1.25 in connection with 1/2 in clevis pin).

   b. Wedge Action Grips, Capacity: 10,000 lb. Temperature range: -150 °C to 250 °C (-240 °F to 480 °F). Specimen Range: - Flats: 0 to .5 inches x 2 inches wide - Rounds: 1/8$^{th}$ to 1/2 inch diameter, grip length: 2.25 inches. Upper and lower fittings: Type Dm. (1.25 in connection with 1/2 in clevis pin).

   c. 2 universal-joint alignment couplings with one end having a Type Dm connection the other end with threads" (1 ½ -12 NF)

q. The system must be able to accommodate existing environment chamber and accompanying stand. The chamber is 75mm wide and is on an adjustable height stand that enters from the rear of the frame. See attached pictures. The two stand feet are 80mm wide, 80mm high and 1.1 meters long. These feet must pass fully underneath the frame. One foot is centered 150mm right of the frame center (when facing the rear of the frame). The other foot is centered 250mm left of the frame center; and

r. The system must include a T-slot table to attach fixtures at base. Maximum width of the table must not exceed 900mm, minimum depth is 900mm, maximum height is 90mm.

## 2.6 Training:

**Item 004 -** Two (2) days (16 hours) of system and software training for up to 4 persons. This training will be on site, in English and must cover as a minimum:

- General materials testing safety precautions and system safety features
- Integration and set-up of load frame and computer
- Mounting and testing of all peripheral fixtures and transducers
- Setup of hardware to the users immediate requirement
- Review of the major system components
- Powering on/off of instrument and software
- Console and software console controls
- Calibration procedures
- Review basic operation manual and related documentation
- Review user's application needs
- Set-up of sample and specimen parameters
- Set-up of test control parameters

- Creation and running of 5 to 10 user test methods
- Testing customer supplied specimens to validate/verify developed test methods
- Review of test method results
- Review of default/standard report format
- Review and set-up of report templates
- Results calculations setup
- Instruction on modifications to test methods and report templates
- Connecting and configuring user transducers
- Creation and use of physical and virtual measurements
- Creating waveforms
- Use of control modes
- Selecting specific calculations and results

## 2.7 Constraints

(a) The work must be performed during regular work hours (0800 to 1600 hours, Monday to Friday) due to required access to DND personnel and resources;

(b) Assembly of the system will take place at the users facility at its intended location for use. Note that the cargo elevator door is 86 inches wide by 126 inches high. The elevator itself is 142 inches deep and has a 12000 lb capacity. This is also a constraint when considering removal of the old tensile test machine.

## Annex B – Pricing and Delivery

**Item 001** 100kN Tensile Testing Machine Instron Model 5985-E2-F2 (Or equivalent) as detailed in ANNEX A
Firm Quantity: 1 UI: EA

P/N Proposed: _____ Manufacturer Proposed: _____

Firm unit price of $ _____ Delivered Duty Paid at Gatineau, Quebec, Canada (Applicable Taxes excluded).

Delivery ARO: _____ Weeks.

**Item 002** Trade-in of the Instron Model 1125 100kN Tensile Test Machine (Serial # 4400-C10260) as detailed at 2.2 of ANNEX A
Firm Quantity: 1 UI: EA

Firm unit price of $ _____ Delivered Duty Paid at Gatineau, Quebec, Canada (Applicable Taxes excluded).

Delivery ARO: _____ Weeks.

**Item 003** Workstation as detailed at 2.5 o. of ANNEX A
Firm Quantity: 1 UI: Lot

Firm lot price of $ _____ Delivered Duty Paid at Gatineau, Quebec, Canada (Applicable Taxes excluded).

Delivery ARO: _____ Weeks.

**Item 004** Training
Firm Quantity: 1 UI: EA

Firm unit price of $ _____ Delivered Duty Paid at Gatineau, Quebec, Canada Applicable Taxes excluded).

Delivery ARO: _____ Weeks.

**Item 005** Installation/Removal Labor
Firm Quantity: 1 UI: EA

Firm unit price of $ _____ Delivered Duty Paid at Gatineau, Quebec, Canada (Applicable Taxes excluded).

Delivery ARO: _____ Weeks.

**The following is for information purposes only**

**Item 006** Optional periodic calibration of the system iaw ASTM standards

Firm unit price of $ _____ Delivered Duty Paid at Gatineau, Quebec, Canada (Applicable Taxes excluded).

Suggested frequency: _____ per year.

**Item 007** Optional advanced on-site training classes

Firm unit price of $ _____ Delivered Duty Paid at Gatineau, Quebec, Canada (Applicable Taxes excluded).

**Item 008** Optional training classes at the manufacturer's headquarters

Firm unit price of $ _____ FCA Free Carrier (At the Contractor's facility) (Applicable Taxes excluded).

# Annex C - Compliance Grid

| Requirement | Compliance (Y/N) | Proposed | Page Reference in Proposal |
|---|---|---|---|
| **1. Frame Requirements** | | | |
| a. Testing speed range: 0.00005 to 1016 mm/min (0.000002 in/min to 40 in/min). | | | |
| b. Crosshead return speed: 1016 mm/min (40 in/min). | | | |
| c. At least 0.9 meters space between the columns. | | | |
| d. Frame that is rated to a minimum of 100kN. | | | |
| e. 100kN load cell (minimum acceptable). | | | |
| f. At least 10.3 feet of working space between top of base platen to the bottom of the crosshead. The maximum height of the machine is limited by the ceiling height, which is 14 feet, 11 inches. | | | |
| g. The load frame must include at least two (2) 80 mm diameter smooth ground guidance rods for the moving crosshead. | | | |
| h. The load frame must include a CSA (Or equivalent) approved emergency stop switch. The system must not restart the crosshead moving when the emergency stop button is released. The emergency stop switch will remain active when covers are removed for service. | | | |
| i. The frame must include adjustable dual level mechanical limit switches that prevent the crosshead from traveling too high or too low. The first level switch must stop the crosshead, but maintain power to the system. The second level limit switch must cut the power to the frame in case the first level switch malfunctions. | | | |
| j. The frame must include an attachment mechanism (such as integrated T-slots) on the front and back of both column covers for easy mounting of accessories;. | | | |
| k. The frame must have a clearly labeled buttons to jog the crosshead UP or DOWN. When released, the crosshead must stop. | | | |
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| l. The frame must include an operator panel which can be used to run and stop tests at the frame as opposed to through the PC and software. The operator panel must have at least two (2) live display read outs that are in synch with the testing software live displays as well as at least two (2) shortcut keys that can be used to carry out functions such as balancing load, strain or marking data. The operator panel must also have a fine position wheel that can be used to move the frame crosshead in small increments to aid in the installation and removal of fixtures. | | | |
| **2. Software Requirements** | | | |
| a. The control software must be a true graphical user interface compatible with Microsoft Windows 7. | | | |
| b. The software must have three levels of user access based on his or her login name and include password protection. | | | |
| c. The software must allow the user to assign at least two (2) soft keys displayed on the monitor to provide quick access to functionality such as: balance load, balance strain, reset gauge length and exclude specimen at a minimum. | | | |
| d. The testing software must be able to perform tensile, compression, flexure, peel, tear, friction, stress relaxation, creep and simple cyclic tests and include an appropriate calculation list for each type of test at a minimum. | | | |
| e. The testing software must be able to perform cyclic testing defined by blocks that can be customized by the user and include: relative ramps, absolute ramps, triangle waveforms and hold patterns at a minimum. | | | |
| f. The software must allow for load and strain control of the test system. | | | |
| g. The control software must include set-up of the following: test speed, limits on all channels, calibration and balance of transducers, specimen dimensions, and results tables at a minimum. | | | |
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| h. The software must allow the user to be prompted during testing and provide a mechanism for the user to select audio, images or video clips to be included in the prompt area when running tests. | | | |
| i. The software must allow the user to specify the test control area - above or below the moving crosshead. | | | |
| j. The software must allow the user to enable a specimen protection safety feature and set a load threshold to prevent damage during gripping and specimen preload. | | | |
| k. The software must allow the user (when configuring a test method) the option to select auto-balance load and/or strain channels before the start of the test. | | | |
| l. The software must allow the user (when configuring a test method) the option to select pre-load or pre-cycle a specimen before the start of a test. | | | |
| m. The software must allow the user to configure a test method to automatically detect a specimen break by a change in rate of load or a percentage drop of the maximum load. | | | |
| n. The software must have the option available to allow for automatic return of the crosshead to the test start position after specimen break is detected and also to be able to select a specimen protect feature. | | | |
| o. The software must allow the user to enable an audio alert defined by a load threshold value. | | | |
| p. The control software must be capable of acquiring data at 1000 Hz across load, displacement, and up to two (2) additional strain channels that can be utilised on an optional basis. Data rates must not be affected by the number of strain channels collected. | | | |
| q. Test control software must be able to automatically store raw data or calculated results in an ASCII file. | | | |
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| r. The software must have the option to integrate any USB camera device (such as a webcam) for video capture of the entire tested specimen and allow for playback of the test with data point selection matching with video frames for analysis. | | | |
| s. The software must offer the following calculations:<br>- Maximum Peak (all available channels)<br>- Minimum Peak (all available channels)<br>- Specimen Break Point (all available channels)<br>- Yield (Zero slope, Offset and Energy at Yield) - Modulus (Secant, Tangent, Automatic Young's, User-defined Young's, Chord)<br>- Slope (Secant, Tangent, Automatic Young's, User-defined Young's, Chord) - Average Load Between two (2) Points based on average load, number of peaks, number of troughs, number of peaks and troughs<br>- Total creep & delta creep<br>- Total relaxation & delta relaxation<br>- Seam slippage<br>- Area reduction<br>- Coefficient of friction (static & dynamic)<br>- Local peak<br>- Poisson's ratio<br>- n-value, r-value & YPE & non-proportional elongation. | | | |
| t. The software must include the capability to define correction factors such as machine compliance, slack, pretension, load and gauge length at a minimum. | | | |
| u. The software must provide CSV raw data output. | | | |
| v. The software must provide the option of storing test reports in one of three (3) formats: MS Word, HTML or PDF. | | | |
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| w. The software must provide a mechanism for editing of the report template including the header, footer and body. The body of the report must be completely customizable with pictures and text and allow for import of test results and graphs. The report editor must be integrated with the software to allow for instant update of the report content when each test is run. | | | |
| **3. Performance** | | | |
| a. Load cell and extensometer transducers available for the system must include self-identification (recognition) electronics in the connector directly attached to these transducers which automates the calibration of these devices. For safety and data integrity issues, operators must not have to select the capacity of a load cell from a list or type in a value in order to calibrate different load cells (or extensometers). Manually calibrated load cells or extensometers requiring calibration weights or calibration micrometer fixture are not acceptable. In addition to the above, the system must allow for manual calibration of third party transducers. | | | |
| b. The load weighing system accuracy must be within +/-0.5% of reading down to 1/1000th of the load cell capacity. | | | |
| c. Any load cell provided must have 105% over range protection that will stop the frame automatically. For safety purposes, the maximum load for a test should be set by identification electronics located in the connector directly attached to the load cell. Operators must not have to select the capacity of a load cell from a list or type in a value in order to calibrate different load cells. Because this identification connector automatically sets the maximum load for a test, this connector must not be detachable from the load cell to prevent it to be used with a different capacity load cells. | | | |
| d. The tension/compression load cell must have an overload capacity without permanent zero shift of 150% of capacity. | | | |

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| e. The system must include an integrated context sensitive help and reference system. The help screen must demonstrate both how a function works and why it is used. The search capability must allow the user to find a specific topic from the help index or by cross-referencing information from another help topic. The system will not be connected to the internet so all help functions, topics, definition, etc must be contained within the software and not rely on internet access. | | | |
| f. Digital displays on the computer monitor should show live load, displacement, and optional strain values in engineering units that can be selected to be Metric, S.I., U.S. customary. For safety purposes, these live displays should not be allowed to be covered up or hidden during a test or while jogging the crosshead. Up to four (4) live display windows must be available for display simultaneously. | | | |
| g. An unlimited number of test methods must be available for storage and retrieval. | | | |
| h. Run time screen must be capable of displaying both the real time graph and the calculated results of multiple specimens simultaneously. | | | |
| i. Data must be acquired at a user selectable, continuous rate without gaps. | | | |
| j. Specimen geometry's for each specimen must include rectangular, irregular (area), cube, cylindrical, 3- and 4-point bend specimens, 90-, 180- and T-peel test geometries and geometries for tear specimens and coefficient of friction tests at a minimum. | | | |
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| k. A real time X-Y plot of two (2) selected variables will be displayed. The variables available for selection for each axis will be load, stress, extension, and either of the two (2) strain channels as selected by the user. The available system of units for each axis will be US Customary, Metric, or SI and will be independently set by the user. Other graph features will include manual and automatic scaling, legend symbols, to distinguish individual test curves, horizontal and vertical offset between test curves, double-Y axis, multi-channel, and selectable number of test curves per display at a minimum. | | | |
| l. The ability to re-analyze past test data using different calculations (as stated in 2.4 s. of Annex A) must be provided. | | | |
| m. USB camera device (such as a Webcam) as described in section 2.4 r. of Annex A, must come with an attachment to mount to the frame. | | | |
| n. The load measurement accuracy must at least 0.5% of the reading down to 1/1000th of a load the cell's capacity. | | | |
| o. Workstation comprising of the following:<br>- One (1) High Performance Workstation<br>- PC meets or exceeds the following components; Intel Quad Core Xeon E5507 2.26 GHZ Processor<br>- 2 Ethernet ports (1 on motherboard and 1 on a PCI card)<br>- 1 GB DDR2 SDRAM<br>- 80 GB SATA Hard Drive<br>- 16 X DVD +/- RW, Data only<br>- nVidia NVS 290, 256 Mb Dual DVI graphics card<br>- Internal Chassis Speakers- Expansion Slots: Two 13.4" and one 5.75" length, full height PCI slots<br>- One serial port and one parallel port- Minitower Chassis<br>- USB Enhanced Multimedia Keyboard- USB Two Button Optical Mouse with Scroll- RoHS Compliant Lead Free Chassis and Motherboard<br>- Accessories: One (1) 24 inch Flat Panel LCD Monitor and one (1) Color DeskJet Printer - HP940C (Or equivalent); | | | |

| | | | |
|---|---|---|---|
| p. The system must be compatible with existing supply of grips, fixtures and extensometers that are configured for use with Instron systems including;<br>a. Wedge Action Grips, Capacity: 20,000 lb. Temperature range: -150 °C to 250 °C (-240 °F to 480 °F). Specimen Range: - Flats: 0 to .5 inches x 2 inches wide - Rounds: 1/8th to 3/4 inch diameter, grip length: 2.25 inches. Upper and lower fittings: Type Dm. (1.25 in connection with 1/2 in clevis pin).<br>b. Wedge Action Grips, Capacity: 10,000 lb. Temperature range: -150 °C to 250 °C (-240 °F to 480 °F). Specimen Range: - Flats: 0 to .5 inches x 2 inches wide - Rounds: 1/8th to 1/2 inch diameter, grip length: 2.25 inches. Upper and lower fittings: Type Dm. (1.25 in connection with 1/2 in clevis pin).<br>c. 2 universal-joint alignment couplings with one end having a Type Dm connection the other end with threads" (1 ½ -12 NF). | | | |
| q. The system must be able to accommodate existing environment chamber and accompanying stand. The chamber is 75mm wide and is on an adjustable height stand that enters from the rear of the frame. See attached pictures. The two stand feet are 80mm wide, 80mm high and 1.1 meters long. These feet must pass fully underneath the frame. One foot is centered 150mm right of the frame center (when facing the rear of the frame). The other foot is centered 250mm left of the frame center. | | | |
| r. The system must include a T-slot table to attach fixtures at base. Maximum width of the table must not exceed 900mm, minimum depth is 900mm, maximum height is 90mm. | | | |