



# COMPANY QUALITY CONTROL MANUAL

MASTER COPY

JULY 28, 2014

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Q.C. Manager Approval

A.I. Acceptance

Date:

**JUL 28 2014**

Date:

**AUG 07 2014**



QUALITY CONTROL MANUAL FOR THE FOLLOWING ACTIVITIES  
IN ACCORDANCE WITH THE ALBERTA SAFETY CODES ACT  
AND REFERENCED STANDARDS

- CONSTRUCTION OF SECTION VIII, DIV.1 PRESSURE VESSELS
- CONSTRUCTION OF PRESSURE FITTINGS IN ACCORDANCE WITH CSA B51
  - CONSTRUCTION OF ASME B31.3 INDIRECT FIRED HEATER COILS
- WELDER/WELDING OPERATION PERFORMANCE QUALIFICATION TESTING AT  
THE SHOP LOCATION ONLY  
AND THE
- REPAIR, ALTERATION OF IN-SERVICE PRESSURE VESSELS
- CONSTRUCTION, REPAIR, ALTERATION AND ERECTION OF PRESSURE PIPING  
IN SHOP AND FIELD LOCATIONS  
IN ACCORDANCE WITH:  
ASME B31.1 & B31.3 PRESSURE PIPING CODES  
AND THE ALBERTA SAFETY CODES ACT AND REGULATIONS

BY  
RJVGASFIELD SERVICES  
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**CONTROLLED MANUAL:**

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## SCOPE OF WORK

This section outlines the scope of work that is covered under this Quality Control Manual. Some information on the use of this Quality Control Manual and the company is also provided.

New pressure vessel construction (limited to ASME Section VIII, Division 1 items), miniature pressure vessel construction, the manufacture of category "A", "E" and "H" pressure fittings, and construction of indirect fired heater coils. under this quality system are at the shop address shown on the Certification of Authorization, or sites controlled from this location, NOT ASME CODE STAMPED.

The repair and alteration of indirect fired heater coils, and pressure piping construction repair and/or alteration to ASME B31.1 and B31.3 as applicable, repairs and alterations to existing ASME Section VIII, Division 1 pressure vessels may be done at the Certification shop address or sites controlled from this location. Boiler External Piping is not within the scope of this Quality Control Manual.

Pressure Welders and Welding Operators performance qualification testing scope, includes issuance of performance qualification cards pursuant to the Alberta Safety Codes Act and the Pressure Welders Regulations at the shop address shown on the Certificate of Authorization.

Preparation of design calculations, drawings and specifications will be contracted to a qualified engineering organization, or will be provided by the client.

All nondestructive examinations, heat treatment and calibration of measuring and test equipment will be subcontracted to an approved vendor.

Forms used to document Quality System activities are referenced in the text and are included as exhibits except official ABSA 'AB' Forms, which are referenced by number.

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## STATEMENT OF AUTHORITY

The purpose of this Quality Control Manual is to establish the organization and systems which R.J.V. Gas Field Services will employ to ensure pressure vessels are designed and constructed in accordance with Section VIII, Division 1 of the ASME Code, repairs to in-service pressure vessels are in accordance with Alberta Safety Codes Act and Regulations and piping is constructed, repair, altered and erected in accordance with ASME 31.1 and B31.3 piping codes Category "A", "E" and "H" Pressure Fittings are constructed in Accordance with CSA B51.

Welder qualifications are in accordance with Alberta Pressure Welder's Regulations and Sec. IX of A.M.S.E. Code.

The Welder Examiner will be appointed by General Manager.

This Quality Control Manual has my full support and shall be used by all personnel engaged in the design, construction and repair or alteration of pressure vessels, pressure piping and welding testing.

The Quality Control Manager is responsible for the implementation of the procedures detailed in this manual. He has sufficient and well defined responsibilities and the organizational freedom to identify, initiate, recommend solutions and stop work authority to any quality control problems.

A Certified Individual has been qualified and certified, and is responsible for the Alberta Safety Codes Act compliance of miniature pressure vessels.

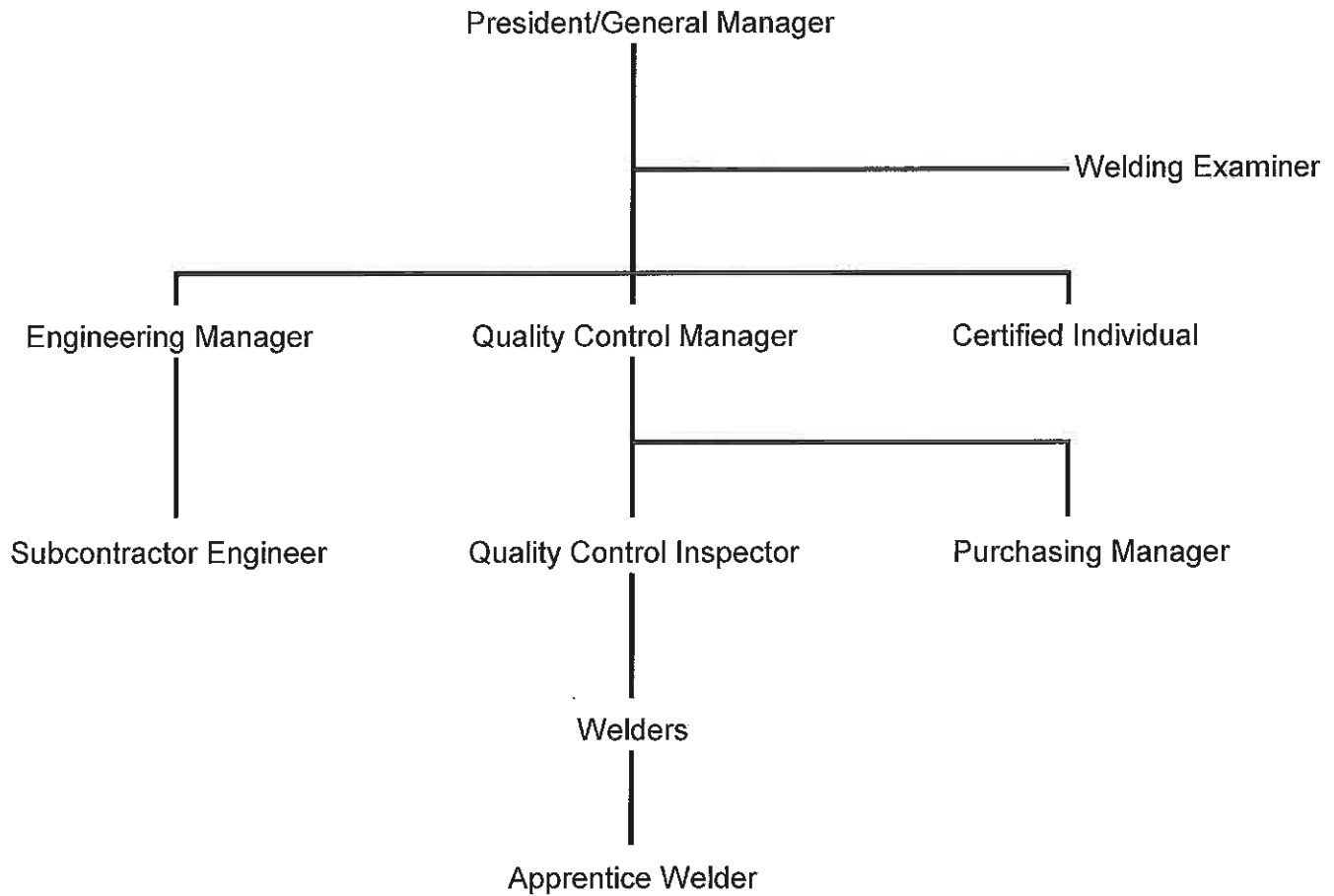
Any unresolved quality control problems shall be brought to my attention for the resolution without compromising the Code or this program.

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

Name: Dale Laniuk  
Date: July 28, 2014



## ORGANIZATION CHART





## MANUAL CONTROL

The Quality Control Manager is responsible for the preparation, revision and implementation of the Quality Control Manual.

The Quality Control Manager will maintain a log to control all copies of the manual. This will list manual numbers and assignees, revision number and issue date.

The Quality Control Manager will review the manual every 12 (twelve) months coincident with issue of Code Editions, and will revise the QC Manual to incorporate any required changes and implement any changes within 6 (six) months of the issued date of the new Edition.

Revisions may also be suggested by any responsible member of RJV Gasfield Services. The manual will be revised by Section; a vertical line in either margin will indicate revision paragraph. Revision number and date will be recorded at the bottom of the page. Acceptance of revisions by the Authorized Inspector and approval by the Quality Control Manager shall be documented by signature on the Table of Contents before they are implemented.

Only one controlled copy of the manual will be used in-house. The Quality Control Manager will insert any revised pages and remove obsolete pages from these manuals. The old marked up manual will be saved in its entirety on file. One controlled copy will be available to the Authorized Inspector for his use; one controlled copy will be forwarded to ABSA. Any manuals requested by customer(s) will be current at time of issue, however, they will be marked "Not Controlled".

Sample forms will be replaced in their entirety every three(3) years and not revised with vertical lines when changes occur. Revision numbers and date will be identified on Sample Forms.



### List of Quality Control Manuals Distributed

Company Name	Copy No.	Date Distributed	Revision # & Date
RJV Gasfield Services	Master Copy	28-Jul-14	Revision #0 July, 2014

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### DRAWING & DESIGN CALCULATION PROCEDURE

Design drawing calculations and specifications, etc., will be completed by the customer, a recognized engineering consultant acting on behalf of R.J.V. Gas Field Services., or in-house by the Engineering Manager. In all cases, the Engineering Manager will ensure that the following functions are completed:

1. Review customers specifications to ensure that the vessel can be designed and constructed in accordance with Section VIII, Division 1 of the ASME Codes latest Edition and Addenda (here in after referred to as the Code).
2. Completion of Design Calculations and Design Registration Application (AB-31) in accordance with the Code.
3. Preparation of construction drawings, with the following information included:
  - a) Title, serial number, and drawing number & revision number.
  - b) Dimensions specified, in consistent units of measurement.
  - c) Maximum Allowed Working Pressure (MAWP) @ the maximum design temperature, Code Edition.
  - d) Nondestructive examination and heat treatment requirements.
  - e) Welding Procedure number and weld detail.
  - f) Hydrostatic test pressure.
  - g) C.R.N.
  - h) Material list with all material detailed by SA or SB specification listed in the Code in consistent units of measurement.
  - i) Minimum design metal temperature @ MAWP.
  - j) Impact test requirements or exemption from impact testing.
  - k) Details of any revisions.
  - l) Notes identifying additional requirements.
  - m) Maximum Allowable External Working Pressure MAWP(EXT)@ the maximum design temperature.(If it is a Design Consideration)
  - n) Volume
  - o) Notes identifying additional requirements



**DRAWING & DESIGN CALCULATION PROCEDURE**  
(continued)

4. Should design software be used for calculations, an alternative calculation will be done to verify software.
5. Engineering Manager will approve all calculations and drawings by signature and date, and submit design specifications and drawings (in duplicate) to the ABSA for acceptance prior to issuance. He will maintain a job file with calculations, drawings and specifications attached to a cover sheet (Sample #16), all identified by the drawing number and/or serial numbers. The Q.C. Manager will assign and control serial numbers for all vessels.

All revisions will be processed and approved in the same manner as the original. Any revisions will be documented on the drawings. Obsolete drawings will be collected from the shop and destroyed by the Q.C. Manager. The Engineering Manager will ensure that only the latest approved drawings are available for the shop floor. These drawings will have "Shop Floor Copy" in large Red letters printed on the drawing. The Engineering Manager will be responsible for posting the Shop Floor copy in the shop and retrieving it when the job is complete. This is the only copy that will be released.

Prior to issuing drawings for previously designed vessels or issuing new drawings based upon an existing design drawing, the Engineering Manager will review and revise as necessary, the design drawings and design calculations to ensure compliance with the latest mandatory Code Edition. This review and approval will be documented by signature and date on the drawings and design calculations.

**MANUFACTURE OF CATEGORY "A", "E" AND "H" PRESSURE FITTINGS**

The system as described above for new pressure vessels shall apply for the manufacture of Category "A", "E" and "H" pressure fittings except as modified below.

- a) The Engineering Manager will complete the Statutory Declaration (AB-41) for all items that qualify as pressure fittings, and submit this document in duplicate along with a Design Registration Application (AB-31) to ABSA Design Survey. Before the manufacture of pressure fittings for installation in other jurisdictions, the applicable jurisdiction shall be contacted to determine requirements for design and construction.
- b) A log book will be kept that will indicate CRN, fitting name, drawing, registration date, expiry Date, and annual review date.

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### MATERIAL CONTROL

The Purchasing Manager will order all materials from the material list shown on the approved drawing. The Purchase Order (Sample No.1) will include the following information in consistent units of measurement.

1. Material precisely as stated on the drawing material list, and Code Edition to which the material must comply.
2. Request for copies of Material Test Reports for all plate material (e.g.: shells, head, repads).
3. Request for Manufacturers Partial Data Reports or Certificate of Compliance for welded pressure parts.
4. Request that formed items meet the requirements of ASME Code Section VIII, Division 1, paragraph UG.79 & reference paragraphs for formed items.
5. Certification for any supplementary tests required (i.e. Charpy impact test results).
6. Signature of Purchasing Manager.

The Quality Control Manager will check the purchase order for correctness and completeness. Distribution of the purchase order will be as follows:

- a) Quality Control/Purchasing Manager
- b) Master Job File
- c) Vendor

7. A statement that all fitting design must be registered with ABSA or the applicable jurisdiction as required.
8. Requirement that all Code required material, markings must be accurately transferred to formed material (shells, heads, repads, manway nozzle necks, etc.).
9. The purchase order number.
10. Other job specifications.

There shall be no substitution of material without prior approval of the Engineering Manager, the customer and the acceptance of the Authorized Inspector. Approved material changes will be noted on the drawings. Revised calculations and drawings will be prepared and issued in accordance with the "Drawing & Design Calculation Procedure" section of this manual when applicable.

The Quality Control Manager is responsible for the receiving, storage and issuance of all material. The Quality Control Inspector will check all material. The Quality Control Inspector will check all materials received against the purchase order, packing slips, and any Manufacturers Partial Data Reports and verify the Code required and material identification markings by circling in paint.

The Quality Control Inspector will check that the material is as specified on the drawings and that material conforms to Code requirements, and will verify all dimensions including thickness and forming.

The Quality Control Inspector will record the thickness, material specification and heat number of shell, head and plate components on the Material Inspection Report (Sample No.2)

Any nonconforming material will be handled as per "Correction of Nonconformities" Section #9.

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## MATERIAL CONTROL (continued)

Material specification and heat numbers will be transferred to all pieces prior to dividing any plate or shell pipe material to locations that will be visible in the completed vessel. Such markings shall be die stamped for carbon steel plate ¼" and over and for non-ferrous material over ½", and by water proof marker for other material. Material markings will also be recorded on as-built sketch on Travel Sheet (Sample #3). The Quality Control Manager will check that recorded heat numbers correspond to those on the Material Test Report and that they conform to the current mandatory edition of ASME Section II requirements. He will indicate his acceptance of the Material Test Reports by signature and date.

All acceptable pipe material will be identified in accordance with Color Code (Sample #15) which will be posted at the storage area and shop.

All acceptable pressure vessel material is issued by the Quality Control Inspector.

The coded marking system will be acceptable to the Authorized Inspector.

### Nozzle Material Identification

The following number and letter symbols are used for identifying the specific material specification and grade:

1B, number ONE letter B

This symbol represents SA-106-B

5B, number FIVE letter B

This symbol represents SA-53-B seamless pipe

15, number One and Five

This symbol represents SA-105-N material.

### Color Code

- SA – 53 – GR.B – Red
- SA- 106 – GR.B – Green
- SA – 333 – GR.6 – Blue
- SA – 516 – 70 – Yellow
- SA – 36 - White

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## EXAMINATION AND INSPECTION PROGRAM

The Quality Control Manager is responsible for the implementation of the examination and inspection program. He will examine all pressure vessel construction to ensure it is in accordance with the approved drawing, the Code, and customer specifications.

The basis of the program is the Travel Sheet (Sample No.3). Drawing, calculations, and other pertinent documents will be presented to the Authorized Inspector prior to construction so that he can indicate his hold and inspection points. No work will proceed beyond a hold point without sign off by the Authorized Inspector. The Quality Control Inspector signs off each examination function after it is completed.

Heat number, material specifications and verified material thickness are recorded on the Travel Sheet by the Quality Control Inspector.

The Quality Control Manager will ensure that the correct hydrostatic test pressure is applied as per drawing and written procedure instructions. He will prepare the Manufacturer's Data Report (AB25) and assure that Nameplate stamping is accurately completed and that the Vessel Nameplate (Sample No. 6) is attached to the correct vessel by locating the Serial Number that is stamped on the shell at the layout stage and match it to the Serial Number on the Nameplate.

When the hydrostatic test has been witnessed by Authorized Inspector the Quality Control Manager will certify the Manufacturers Data Report and present it to the Authorized Inspector for his review and acceptance.

Distribution of the Manufacturers Data Report, with all required Manufacturers Partial Data Reports attached, will be as follows:

1. Original to the Authorized Inspector.
2. One copy to the user.
3. One copy to the job file.
4. One copy to the jurisdiction where the vessel is to be installed.

Copies of all Manufacturers Partial Data Reports shall be attached to the Manufacturer's Data Report.



### NEW CATEGORY "A", "E" AND "H" PRESSURE FITTINGS

Category "A", "E" and "H" pressure fittings will be manufactured in accordance with this written quality system with the following modifications and exceptions:

a) Inspection by the Authorized Inspector is not normally required for the manufacture of pressure fittings. All inspections performed by the Authorized Inspector as described in this manual or by Code, shall be performed by the Quality Control Manager except as follows:

(1) In instances where a Category "H" Fitting Containing Lethal Substances is to be manufactured, fabricated inspection by the Authorized Inspector is required by CSA-B51 Figure 1C. The required fabrication inspection shall be conducted in accordance with the new pressure vessel criteria contained in this section of the manual.

b) The Travel Sheet (Sample 3) used for construction of new pressure vessels shall be used for each fitting or concurrent batch of fittings and shall be signed and dated by the Quality Control Manager, as each function is completed for each fitting or batch of fittings.

c) The Quality Control Manager shall verify the hydrostatic test pressure to the approved drawing and witness the Hydrostatic test.

Each Category "A", "E" and "H" Pressure Fitting will be as a minimum, identified by Direct Stamping as shown in example below

R.J.V.  
CRN# 0H0102.2  
MAWP 975 psi  
@ Temp. 150°F  
MDMT: -20 @ 975 psi  
Year built 2014  
Batch #

d) A CSA B51 Manufacturer's Data Report for Miniature Pressure Vessels (AB-24) shall be furnished for miniature pressure vessels registered as Category "E" or "H" pressure fittings. When this form is used to document pressure fitting compliance there is no requirement for a Certified Individual to sign the M.D.R. for miniature pressure vessels. Up to 5 days consecutive production of identical items may be documented on a single report.

e) The Quality Control Manager will distribute the Data Report to;  
(1) the customer, and  
(2) the job file.



## MINIATURE VESSELS

Vessels that fall within the limitations of U-1(j), Section VIII, Division 1, shall be designed and constructed in full compliance of the Code. All procedures detailed in this manual shall apply, except as modified below:

### MINIATURE PRESSURE VESSEL CONSTRUCTION

Supplementary to the requirements of CSA B51, the following items will be submitted for design registration as pressure vessels in accordance with the regulations under the Alberta Safety Codes Act:

- |                                |   |
|--------------------------------|---|
| a) steam jacketed sterilizers, | b) autoclaves,                                  |
| c) steam jacketed kettles,     | d) air cooled exchanger headers,                |
| e) compressor bottles,         | f) hair pin heat exchangers,                    |
| g) in line separators,         | h) fabricated strainers, filters and air dryers |

Pressure Vessel categorized by CSA B51 and the ASME Code [Section VIII, Division 1, paragraph U-1(j)] as Miniature Pressure Vessels will be manufactured in accordance with all of the requirements this Quality Control Manual, CSA B51 and the ASME Code with the following additions and/or exceptions:

- a) Any pressure vessel that is not provided with a quick actuating closure, or required by the ASME Boiler and Pressure Vessel Code to be fully radiographed, and where the pressure vessel does not exceed the pressure-volume limits described in sub-paragraphs 1 through 3 below shall not be required to be inspected by the Authorized Inspector;
  - (1) 5.0 cu. ft. (0.15 cu. m.) in capacity and 250 psi. (1725 kPa) design pressure or,
  - (2) 3.0 cu. ft. (0.085 cu.m.) in capacity and 350 psi. (2415 kPa) design pressure or,
  - (3) 1.5 cu. ft. (0.0425 cu. m.) in capacity and 600 psi. (4140 kPa) design pressure.
- b) The Quality Control Manager has the responsibility of assuring that the quality control, the detailed examinations, and the test required by this Quality Control Manual and by the Code are completed. Some of the Code specified responsibilities are summarized in Section VIII, Division 1, paragraph UG-90.
- c) The duties, responsibilities, activities and certification of the Certified Individual are described in the Certified Individual Requirements.
- d) The Travel Sheet (Sample 3) shall be initialed and dated by the Quality Control Inspector, as each examination function is completed. On the back side of the Travel Sheet the material tabulation details (thickness verification and identification) and Welders' symbols for specific joints shall be recorded, and fit-up visual examination records shall be initialed but not dated to indicate completion and acceptance.

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- e) The Quality Control Manager shall ensure that the correct hydrostatic test pressure is applied to the completed vessel as specified on the approved drawing.
- f) Each item registered as a vessel will be identified with a Vessel Nameplate (Sample 6), or through direct stamping in compliance with ASME Code Section VIII, Division 1, paragraph UG-116 with the addition of the CRN number. The Quality Control Manager shall ensure that all data on the nameplate or stamping is in accordance with the Manufacturer's Data Report and the approved drawing.
- g) The Quality Control Manager shall ensure that the correct nameplate is attached to the proper vessel by matching the serial number on the nameplate to the serial number that has been stamped on the shell of the vessel during layout.
- h) The Quality Control Manager shall prepare and certify the CSA B51 Manufacturer's Data Report for Miniature Pressure Vessel (AB-24) and all other documents pertaining to the completion of the vessel.
- i) Upon verification of compliance with all applicable Code requirements the Certified Individual shall sign the Manufacturer's Data Report for the Miniature Pressure Vessels Certificate of Compliance, prior to his release of control of the pressure vessel.
- j) The Quality Control Manager will distribute the Manufacturer's Data Report to;
  - (1) the user or his designated agent,
  - (2) the job file, and
  - (3) the jurisdiction where the vessel will be installed.

NOTE: For all Miniature vessels without AI inspection, manufactures are advised to confirm acceptance of these vessels with the jurisdiction at the location of installation. Some jurisdictions do not permit installation of small vessels without the ASME Certificate Mark and "UM" designator.

#### CERTIFIED INDIVIDUAL REQUIREMENTS

The purpose of this document is to describe the duties, responsibilities, activities and certification of the Certified Individual and for the certification and appointment of the CI.

The President of RJV Gas Field Services is responsible for verifying the qualifications of a prospective Certified Individual and for the certification and appointment of the CI.

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The responsibilities of RJV Gas Field Services relative to the Certified Individual are as follows:

- a) Ensuring that the CI is knowledgeable regarding the RJV Gas Field Services Quality Control System and ASME Section VIII, Division 1 and referenced Code Sections.
- b) Verifying that the CI has the requisite knowledge, acquired through training and/or experience, appropriate with the scope and complexity of the required oversight activities. Or providing the additional training necessary to fulfill this requirement.
- c) Maintaining records of the training, experience and certification of the CI.
- d) Evaluating, on an annual basis, the knowledge and ability of the CI to perform the required duties. Continued certification shall be documented and may be based upon;
  - (1) continued satisfactory performance, or
  - (2) re-training and re-certification.
- e) Providing the CI with all documentation (e.g., drawings, Travel Sheet, procedures, specifications, MTR's, etc.) necessary for him to perform his oversight activities.
- f) Requiring the CI to participate in annual audits conducted by the Authorized Inspection Agency and the triennial joint review.
- g) Re-certifying the CI every three years.
- h) Ensuring the C.I. is qualified to ASME QAI-1

The duties of the CI are as follows:

- a) Reviewing the documentation for each miniature pressure vessel to be certified, to verify that the examination, testing and material requirements of ASME Section VIII, Division 1 have been met.
- b) Witnessing all miniature pressure vessel tests.
- c) Performing oversight of QCM and QCI activities relative to miniature pressure vessel construction.
- d) Signing miniature pressure vessel Manufacturer's Data Report after the QCM has certified the Manufacturer's Data Report for RJV Gas Field Services.



## HYDROSTATIC TEST PROCEDURE

All hydrostatic tests performed in the shop will be undertaken with the maximum regard to personnel safety. The hydrostatic tests are the responsibility of the Quality Control Manager. All unauthorized personnel will stay clear of the area where the test is being performed.

1. The Quality Control Manager will be responsible for all hydrostatic tests. These tests will be witnessed by the Authorized Inspector.
2. All air will be vented from the vessel during filling and the water will be at room temperature. If not, then the vessel will be held for sufficient time to bring the water to a ambient temperature, before pressurizing the vessel, but in no case will the water temperature be less than 30° above the MDMT.
3. Two Pressure gauges will be used. One mounted directly on the vessel. This pressure gauge should be graduated to approximately twice the test pressure, but in no case be less than 1.5 times nor more than 4 times the test pressure.
4. The pressure will be increased gradually to the hydrostatic test pressure as stated on the approved drawing.
5. Following the application of test pressure, an inspection shall be made of all joints and connections. This inspection shall be made at a pressure not less than the test pressure divided by 1.3.
6. The test will be held long enough for the Authorized Inspector to complete his visual examination of all joints and connections.
7. Upon completion of the test, the pressure will be gradually released through a drain valve and the vessel will be vented before removing any fittings.
8. At this time the Pressure Test Record (Sample 14) will be completed, signed by the Quality Control Inspector and placed in the vessel file.

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## CORRECTION OF NONCONFORMITIES

A nonconformity is any condition found at receiving, construction, or examination and testing which does not meet the requirements of the Code or job specifications. Repairs to weld metal that are identified by planned QC examinations shall be completed in full accordance with the Code this QC manual, the original job specifications and the method pre accepted by the A.I., but need not be documented as a nonconformity.

All nonconforming material received will be returned immediately to the supplier or will be segregated from acceptable material and tagged with a Hold Tag (Sample 8). This will be the responsibility of the Quality Control Inspector.

When a nonconformity is found during construction, an immediate hold shall be placed on that portion of work affected by notation on Travel Sheet. The item will also be identified with Hold Tag or by marking "Hold Do Not Use" (when applicable).

The Quality Control Manager shall approve proposed disposition of all nonconformities involving design change, ie. Change in maximum working pressure, temperature, material substitutions, incorrect size, and alterations. When design changes are required, revised design calculations and drawings will be prepared in accordance with Section 4 of this manual. All designs changes shall have prior acceptance from the Authorized Inspector.

If a decision is made to repair the material/item, than a repair procedure will be prepared and approved by the Quality Control Manager. Proposed repair procedures shall have the Quality Control Manager's signature of approval and the Authorized Inspector's acceptance on the Nonconformity Report.(Sample 7)

If additional operations are required they will be documented on the Travel Sheet and presented to the Authorized Inspector to allow him to designate his hold points.

Hold tags shall only be removed when the nonconformity has been resolved to the satisfaction of the Quality Control Manager and the Authorized Inspector so as they have indicated acceptance by signing off the Nonconformity Report (Sample 7) and Travel Sheet (Sample 3).

A copy of the Nonconformity Reports will be kept in the quality control file and a separate file will be maintained by the Quality Control Manager. The Quality Control Manager will review all Nonconformity Reports periodically and initiate corrective action as required to prevent reoccurrence.



## NONDESTRUCTIVE EXAMINATION

All Nondestructive Examinations will be performed in accordance with Section V and Section VIII, Division 1 of the ASME Code.

The Quality Control Manager is responsible to ensure Design, code, and Client requirements are met. These are determined by the Design Engineer Mgr. All Nondestructive Examination is subcontracted to a qualified agency. All personnel performing NDE must be qualified and certified to their employers' written practice, in accordance with SNT-TC 1A (latest accepted edition) and C.G.S.B.. All personnel qualification will be kept on file in the main office. The Quality Control Manager is responsible for checking qualifications, certification records, and ensure vision are current for NDE personnel.

All Nondestructive Examination reports, interpretation sheets, radiographs, procedures and personnel qualification and certification will be available to the Authorized Inspector.

The NDE subcontractor's SNT-TC-1A Level III examiner will act as our representative and will be appointed by letter, signed by the Quality Control Manager.

All non destructive examinations will be performed in accordance with acceptable written procedures approved by Subcontractors NDE Level III Examiner. UT, MT and PT procedures shall be demonstrated to the satisfaction of the Authorized Inspector.

Maintaining traceability of Nondestructive Examination reports/radiographs to the location on the vessel shall be done by stamping the seam number and direction of location maker.

The Authorized Inspector shall have the right to call for the re-qualification of any procedure or examiner for just cause.

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## **WELDING CONTROL**

All welding shall conform to the requirements of Section VIII, Division 1 and Section IX of the ASME Code as well as the Alberta Pressure Welders Regulations.

A recognized material testing laboratory will be engaged to assist in the preparation of the Welding Procedure Specification (WPS) and Procedure Qualification Record (PQR).

The Quality Control Manager will supervise the welding of the test coupons by employees of RJV Gasfield Services. The tensile and bend tests will be completed by a qualified laboratory. The completed Welding Procedure Specification and Procedure Qualification Record duly certified by the Quality Control Manager will be submitted to the Authorized Agency for registration.

The Welding Examiner will supervise all welder performance tests and will prepare and certify a Performance Qualification Test Record (Sample No.12).

The Quality Control Manager is responsible for instructing, assigning and supervising the welders. Each qualified welder will receive a stamp to be used to identify his work. He will stamp symbol to each weld he completes (at least once every 3 feet or 1 meter). When such stamping is prohibited by customer or Code, the Quality Control Manager will maintain an as-built sketch with welders' symbols identified for all welds.

The Quality Control Manager will keep a Welder Log Sheet (Sample 10) and Welders Continuity Record (Sample 11) to document each welders name, identifying symbol, essential variables and the date of expiry of his Performance Qualification Card and Continuity Record showing month welded on each specific process for within a 6 month period..

The Quality Control Manager will order all welding consumables. They must be to S.F.A. specifications and AWS classifications. When received, they will be checked by the Quality Control Manager to ensure this. Non-conforming consumables will be returned to the vendor.

The Quality Control Manager is responsible for the storage and issuance of consumable. All materials will be stored in clean, dry facilities in accordance with manufacturers' recommendations.

After removal from sealed containers, low hydrogen rods will be in a temperature controlled rod oven at manufactures recommendations.

Welders will be issued sufficient low hydrogen rods for a 4 hour period. Once issued, unused low hydrogen rods will not be returned to the cabinet and will be used for Non-Code work only.



**WELDING CONTROL**  
(continued)

The Quality Control Manager will be responsible for:

- a) Issuing welders with identification symbols.
- b) Ensuring that each weld is stamped with the welder's symbol.
- c) Ensuring that all weld sizes are in accordance with the design.
- d) Maintaining records of welder's qualifications parameters and date of expiry.
- e) Ensuring that all welding is performed in accordance with the approved procedure.
- f) Ensuring that a welding procedure specification is accessible to all qualified welders.

The Authorized Inspector has the right to require the re-qualification of any welder or procedure for due cause

**GENERAL**

**TACK WELD**

All tack welds shall be using procedures qualified to ASME Section IX. Tack welds done by subcontractors shall be completely removed. Tack welds left in place shall be welded using welders qualified to Section IX, and shall be properly prepared by grinding or other suitable means and shall be visually examined for defects, and if found to be defective shall be removed.

**CLEANING**

The surfaces of the parts to be welded shall be free of scale, rust, oil, grease and other harmful foreign matter at least 1/2" from welding joint for ferrous material and 2" for nonferrous material.

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## HEAT TREATMENT

All heat treatment will be subcontracted to a qualified vendor. The Quality Control Manager will review subcontractor's facilities to verify that heat treatment procedures and calibrations are in compliance with Code requirements.

The Quality Control Manager will prepare the written Heat Treatment Instruction Form (Sample 9) for all heat treated items.

The Quality Control Manager will review all time temperature charts for legibility and compliance with the heat treatment Instruction Form. All temperature charts shall be identified with the vessel serial numbers and shall be signed and dated by the subcontractors representative.

All temperature charts and heat treatment instructions will be filed in the job file which will be made available to the A.I. for his review.

The Quality Control Manager will examine all heat treated items upon return to the shop.

The subcontractor's quality control procedures will be reviewed annually by the Quality Control Manager.

A copy of the subcontractor's heat treatment procedures will be kept on file at all times.



## **CALIBRATION OF MEASURING AND TEST EQUIPMENT**

The Quality Control Manager is responsible for the documentation and procedures to ensure that only calibrated examination, measuring and test equipment is used in fulfilling the requirements of Section VIII, Division 1 of the ASME Code.

1. The hydrostatic test gauges shall be calibrated on an annual basis or whenever error is suspected. The gauge shall be calibrated against a Deadweight Tester or Master Gauge that has a calibration record traceable to a national standard.
2. Should a gauge be found not repairable or unable to be calibrated, it will be quarantined from the shops and removed from service.
3. The Pressure Gauge Calibration Record Form (Sample 4) will be used as a calibration test record for gauges used for test purposes.
4. Deadweight Certification Reports from the manufacturers will also be used as proof of calibration.

All test equipment used by RJV Gas Field Services will be calibrated on an annual basis, and at intervals specified by the manufacturer. With the calibration record kept with the tester if possible, and a copy kept in the Q.C. Manager's office. Prior to use of any measurement equipment, the equipment shall be verified to be working properly and that it is within the manufacturer's specified calibration limits.

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### **AUTHORIZED INSPECTOR**

The ASME Accredited Authorized Inspection Agency is ABSA. The Authorized Inspector from this agency performs inspections of pressure vessels to ensure that they are in conformance with Code requirements.

To enable the Authorized Inspector and his Supervisor to perform these inspections and audits, free access to all parts of RJV Gasfield Service's manufacturing facilities and sub contractors facilities will be granted during the fabrication, assembly and testing of pressure vessels built under the Code.

In addition, the Authorized Inspector and his Supervisor shall have access to all drawings, calculations, specifications, procedures, repair procedures, records, test results, and any other documents necessary for him to perform his duties.

A controlled copy of this manual will be available in the quality control office for use by the Authorized Inspector.

The Quality Control Manager is the liaison with the Authorized Inspector.

At least annually the Q.C. Manager shall accompany the A.I.S. during his annual review.

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## **RECORD RETENTION**

The following application documentation will be assembled by the Quality Control Manager and placed in the job file.

1. Manufacturing Drawings & Design Calculation's, including any applicable proof test reports
2. Job Order
3. Material Test Reports and/ or material certifications
4. Heat Treatment Records and Test Results
5. Travel Sheet
6. Impact Tests (when required)
7. Manufacturer's Data Report (as applicable) with Manufacturers Partial Data Reports attached
8. Nonconformance Report and disposition
9. Post Weld Heat Treatment Records
10. Non-Destructive Examination Reports
11. Boiler Pressure Vessel Repair and Alteration Report (AB40)
12. Pressure Piping Construction and Test Data Report (AB83)
13. A nameplate stamping facsimile
14. Copy of NDE Examiners Certificates
15. Welders Qualification Records for each welder who welded on project.
16. Repair Procedures and Records
17. Pressure Test Record
18. Welding Procedure specifications
19. Procedure Qualification Record

A Master File will be maintained by the Quality Control Manager with items: 1,3,8,14,15,16,18,19 for review upon request by an A.I. or company representative or inspector.

All of the above documentation, as applicable, will be retained on file for at least 5 years.

Radiographic films for each vessel or vessel part will be retained until the Manufacturer's Data Report has been signed by the Authorized Inspector. For piping systems, Radiographic film will be retained until signed off by company inspector or five years.

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**PRESSURE PIPING**  
(Not Code Stamped)

The Quality Control Manager shall be responsible for overseeing all operations and designating personnel. All applicable aspects of this Quality Control System also apply to pressure piping design and construction with the following exceptions:

1. All pressure piping design calculations, and drawings shall be completed in accordance with ASME B31.1 and B31.3.
2. Design will be submitted to ABSA with General Engineering Requirements for Design & Construction of Pressure Piping Systems (AB-96) when total capacity of the system exceeds 0.5 cubic meters. Design Drawings for piping systems exceeding 0.5 cubic Meters shall be stamped by a Registered Professional Engineer. A Completion of Construction Declaration form (AB-81) shall be submitted to ABSA. All pressure piping material will be ordered to a specification listed ASME B31.1 or B31.3 as applicable.
3. All pressure piping material will be ordered to a specification listed ASME B31.1 or B31.3 as applicable.
4. Inspection is the responsibility of the Quality Control Manager and the Owner's Inspector.
5. Marking up construction drawings, (spools, isometrics) will be used to record completion of examinations and inspections, location of radiographs, and welder symbol. A travel sheet will not be used.
6. The Pressure Piping Construction and Test Data Report (AB-83) will be completed for each system. ASME data reports shall not be used. One copy will be provided to the owner and one will be retained on file for a minimum period of five years.
7. Threaded piping shall be designed and constructed with the specific service limitations of ASME Pressure Piping Codes B31.1 and B31.3, as applicable. Repairs and alterations of threaded piping will be completed in accordance with the above Codes of construction. Threaded piping is specifically not permitted under the following service conditions:

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**PRESSURE PIPING**  
(Not Code Stamped)

- a. For ASME B31.1 Applications; Wherever severe erosion, crevice corrosion, shock or vibration is expected to occur, and at temperatures over 925°F. Outside of these exclusions nominal pipe size and thickness limitations govern.
  - b. For ASME B31.3 Applications; Severe cyclic service conditions (except as permitted in par, 314.2). **THREADED PIPING SHOULD BE AVOIDED WHEREVER SEVERE EROSION, CREVICE CORROSION, OR CYCLIC LOADING MAY OCCUR.**
8. In addition to the previous conditions. For ASME B31.3 applications. Threaded piping shall be designed and constructed for normal fluid service and Category D fluid service only (fluid service categories are defined in ASME B31.3, paragraph 300.2)
9. Refer to (Sample #17) for information on pipe thread dimensional requirements and (Sample #18) for installation instructions for Swagelok tube fittings on instrumentation tubing.

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## **REPAIRS TO IN-SERVICE PRESSURE VESSELS**

All repairs to in-service pressure vessels shall be in accordance with the Alberta Safety Codes Act and Regulation, and ASME Section VIII, Division 1 whenever possible.

All applicable requirements detailed in the manual shall also apply for repairs, with the following exceptions:

1. The Quality Control Manager will develop a repair procedure which details step by step the method of repair. This must be accepted by the Authorized Inspector prior to the start of repairs. When required by the Authorized Inspector the repair procedure will be submitted to ABSA's Design Survey department for review and registration.
2. When the repair involves changes in original design, revised calculations and drawings will be prepared and submitted to ABSA's Design Survey department for review and registration in accordance with Section 4 of this manual.
3. The Boilers & Pressure Vessel Repair or Alteration Report form (AB-40) will be used to document the repair(s) or alteration. One copy will be given to the owner, one to the Authorized Inspector, and one will be retained on file.
4. When repairs are needed. The "Vessel Repair Nameplate" (Sample 13) will be used unless specifically exempted by the Safety Code's Officer.

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## **WELDER/OPERATOR PERFORMANCE QUALIFICATION TESTING PROGRAM**

### Purpose

The section outlines the system to control welder and operator performance qualification tests of R.J.V. Gas Field Service. employees and issue of performance cards pursuant to Alberta Pressure Welder's Regulations. All applicable requirements defined in other sections of this Quality Control Manual shall also apply to welder and operator performance tests conducted pursuant to Alberta Pressure Welders' Regulations, except as modified herein.

### Material Control and Traceability

The Welding Examiner is responsible for control of the welding coupon material. His duties include:

- To verify that each cut piece identified with established coded marking or color coding, identifying specification and grade.
- To control the issuance of test material to candidate.
- To issue unique I.D. number/symbol to candidates and ensure that this is marked on each coupon.
- To ensure candidates I.D. and specimen number is marked on each specimen.

### Performance Qualification Program

The Quality Control Manager is responsible for designating the Welder Examiner. The Quality Control Manager's duties are as follows:

- To verify that the individual to be assigned Welding Examiners duties has the Welding Examiners Certificate of Competency issued by ABSA, before the Welding Examiner is appointed.
- To maintain a file for each Welding Examiner containing, all relevant documentation and a letter of appointment signed by the Quality Control Manager.
- To ensure that the examiner is fully conversant with all applicable requirements defined in the Quality Control Manual.
- To monitor the standards employed by the Welding Examiner.
- To notify ABSA, in writing, if the Welding Examiner leaves R.J.V. Gas Field Service.



## WELDER PERFORMANCE QUALIFICATION EXAMINATION AND TEST PROCEDURES

### Code References

- |   |                                    |
|---|------------------------------------|
| 1. Review welding procedure and establish welder's performance test requirements.   |                                    |
| 2. Verify that test coupon material spec., grade, thickness, diameter, weld joint preparations are correct.               | QW423, QW452, QW452.4              |
| 3. Instruct candidates re: test procedure, acceptance standards, time limit and welding procedure requirements.           | Per ASME Section IX                |
| 4. Mark candidate's unique ID number/symbol on test coupons.  |                                    |
| *5. Examine fit up, tack welds.   | Section VIII, UW31, UW33           |
| *6. Verify test position.   | Section IX, QW110, QW120           |
| *7. Examine root (penetration, profile, fusion, contour, etc.   | Per ASME Section VIII, Div.1, UW35 |
| *8. Examine completed weld surface condition reinforcement, penetration, fusion, contour, etc.                            | QW 302.4, QW-191<br>UW-35          |
| 9. Outline position of bend test and specimens.   | QW463.2, QW160, QW302.3            |
| 10. Verify that specimen size and thickness are acceptable after preparation. Mark candidate and specimen number on each. | QW462.2, QW462.3                   |
| 11. Verify test jig tolerances.   | QW162, QW466                       |
| 12. Examine specimens after bending.  | QW163, QW 302.4                    |
| 13. Review reports of any subcontractor, physical tests, (bend tests, etc.).  |                                    |
| 14. Review radiographs, film and interpretation sheets.   | QW302.2, QW191                     |
| 15. Prepare and certify welder's record form.   |                                    |
| 16. Prepare and certify performance card.   |                                    |

Reference code paragraphs shown are for Section VIII, Div.1. If other codes apply i.e. ASME B31.3, then any code paragraphs for requirements which are more restrictive must be indicated.

\*Hold point, weld may not continue without authorization from the Welding Examiner.

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## **WELDER/OPERATOR PERFORMANCE QUALIFICATION EXAMINATION PROGRAM**

The Welding Examiner's duties include the following:

- To verify that each applicant has a valid Certificate Competency, issued by ABSA (Grade "B", Grade "C", Machine Operator Certificates as applicable), and retain a copy of Certificate/Initial Performance Qualification Cards on file.
- To review the welding procedure requirements and test standards with candidate and Quality Control Manager.
- To verify that the Performance Qualification test is performed in accordance with the designated welding procedure and test standards. Refer to Examination and Test Procedure, Section 18, Page 2.
- To develop additional examination and test procedures when applicable, i.e. fillet weld tests and any special processes per QW380.

-To prepare and certify Welder Qualification Record for each test, and issue the Welding Performance Qualification Card, (Sample #12) upon satisfactory completion of test. Each card shall be certified by the Welding Examiner and Welder/Operator.

### Nondestructive Examinations

The Welding Examiner will review all performance tests, radiographic film interpretation sheets and NDE reports, and will ensure that these are identified with candidates' symbol/I.D. number. Acceptance standards for required nondestructive examinations shall be in accordance with ASME Section IX. Visual examination standards shall be in accordance with referencing Code (Section VIII, Div.1, ASME B31.1 or B31.3 as applicable).

### Record Retention

The Welding Examiner is responsible for all performance qualification test records. He will ensure the following:

- That performance qualification records, physical test results and NDE reports are identified with welder/operator symbol/ID number and are retained on file for at least five years.
- That the test coupons and specimens are marked with welder/operator symbol/ID number and are retained for at least ninety days if the candidate fails the qualification test, 30 days if the candidate passes.
- That the job number and weld identification No.(s) are marked on the welder's record form if the welder/operator is qualified using production welds.

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## **FABRICATION OF INDIRECT FIRED HEATER COILS**

The purpose of this section is to describe the special procedures and controls for the design, fabrication, and inspection of indirect fired heater coils. All fabrication of indirect fired heater coils shall be in accordance with the Alberta Safety Codes Act and Regulations, CSA B51 and ASME B31.3. All other sections of this Quality Control Manual shall apply, except as specifically modified within this section.

The design, construction, installation, inspection and testing of indirect fired heater coils shall be in accordance with the Alberta Safety Codes Act and Alberta Energy Regulator(AER) requirements, as applicable [for Alberta pipeline service, reference AER Directive 077]

The Engineering Manager shall be responsible for verifying that the design drawing and specifications have been submitted in duplicate to the ABSA Design Survey department accompanied by a Design Registration Application (AB-31) for all indirect fired heater coil designs. The Engineering Manager shall ensure that each indirect fired heater coil design has been issued a CRN.

All material shall be ordered to an ASME SA/SB specification, with a request for material test reports for all pressure retaining components (e.g., pipe, return bends, flanges, etc.).

Inspection by the Authorized Inspector is mandatory.

The QCM shall initiate an individual Travel Sheet (Exhibit 3) for each coil to be constructed. This document is to be presented to the AI prior to the start of construction. With the acceptance of the AI, the inspection and hold point designation that must occur prior to commencing construction.

The AI shall be notified reasonably in advance of any hold points. Work shall not proceed beyond an established hold point until the AI has released the hold by initialing and dating the Travel Sheet.

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The QCM shall prepare the Manufacturer's Data Report For Indirect Heater Coils (AB-28) and verify that the nameplate information is complete and correct in the Heater Coil Sample Nameplate (Sample 5) format. After the AI has found the pressure test acceptable, the QCM will certify the Manufacturer's Data Report and then present it to the AI for his acceptance.

After signing the Manufacturer's Data Report the AI will apply the Alberta "A" number to the nameplate for heater coils that are to remain in Alberta. The QCM is responsible for ensuring that the completed nameplate is installed on the correct coil.

#### APPLICABLE DOCUMENTS/FORMS

- Travel Sheet, Exhibit 3
- Heater Coil Sample Nameplate, Exhibit 5

#### ABSA/Alberta Government (Municipal Affairs) Forms

- Design Registration Application, AB-31
- Manufacturer's Data Report For Indirect Fired Heater Coils, AB-28

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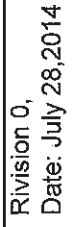


## SAMPLE FORMS

	Sample No.	Rev.No.	Revision Date
Purchase Order	1	0	July 28,2014
Material Inspection Report	2	0	July 28,2014
Travel Sheet	3	0	July 28,2014
Pressure Gauge Calibration Record	4	0	July 28,2014
Nameplate Indirect Fire Lineheater	5	0	July 28,2014
Nameplate Vessel	6	0	July 28,2014
Nonconformity Report	7	0	July 28,2014
Hold Tags	8	0	July 28,2014
Heat Treatment Instruction Form	9	0	July 28,2014
Welder Log Sheet	10	0	July 28,2014
Welder Continuity Record	11	0	July 28,2014
Welder Qualification Card	12	0	July 28,2014
Vessel Repair Nameplate	13	0	July 28,2014
Pressure Test Record	14	0	July 28,2014
Color Code	15	0	July 28,2014
Drawing Code of Construction Year	16	0	July 28,2014
Pipe Thread Assembly Dim. Requirements	17	0	July 28,2014
Swagelock Installation Instructions (5 Pages)	18	0	July 28,2014

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# MATERIAL INSPECTION REPORT

INSPECTED

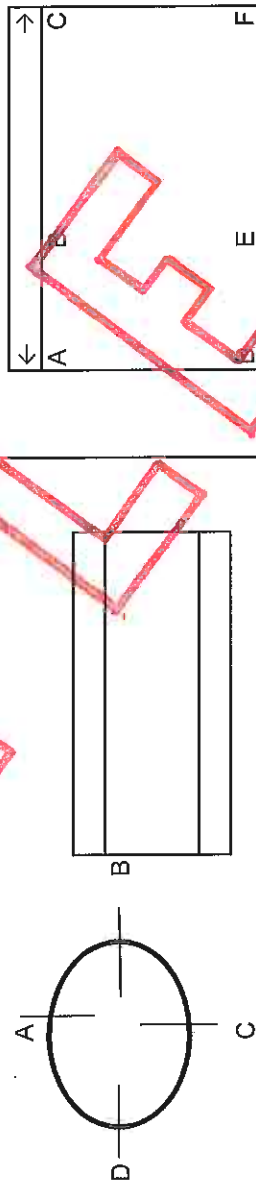
DATE \_\_\_\_\_

FROM PURCHASE ORDER NUMBER

**GAS FIELD SERVICES**

4901 Bruce Road Vegreville, Alberta T9C 1C3

Phone: (781) 632-7774

[illegible]

## PLATE & REPADS

REMARKS:

# Travel Sheet

Sample #3

Authorized Inspector to be given travel sheet prior to construction so that he can indicate hold points and Inspection Points.

"H"-Hold Point, "I"- Inspection Point, "R"-Review, "W"- Witness Point

H Points established - Sign & Date

(Authorized Inspector)

Vessel Serial #		Shop Dwg:		(A) #	
Vessel Title:		CRN #		CRN Dwg:	
ITEM	COMMENTS	AUTH Insp., Hold Rev., Witness POINTS	DATE FUNCTION COMPLETE & INSPECTORS INITIALS		
			QC INSPECTOR	AUTHORIZED INSPECTOR	
APPROVED DRAWING					
CALCULATIONS ON FILE					
MATERIAL CHECKED AGAINST DRAWING, MATERIAL LIST					
MTR'S CHECKED					
VESSEL LAYOUT					
NOZZLES	ORIENTATION				
& FITTINGS	RATINGS				
FIT	NOZZLES & FITTINGS				
UP	SHELL & HEAD				
INTERNALS (tray, baffles, etc)					
INTERNAL INSPECTION					
MATERIAL INSPECTION REPORT					
WELD SIZES					
WELDERS I.D.					
EXTERNAL AFTER COMPLETION OF ALL WELDING					
INTERNAL ON TYPE 1 JOINTS					
RADIOGRAPHS					
OTHER N.D.E.					
IMPACT TESTS					

# 1,000 psi Gauges

Master Gauge #

Master Gauge Calibration Date:

[illegible]

Sample #5

**Nameplate Indirect Fired Line Heater**

W  
HT  
RT

Certified By

**RJV**

**GAS FIELD  
SERVICES**

Vegreville, Alberta  
(780)632-7774

Phone

UNIT NAME

**Line Heater**

HIGH PRESSURE COIL

Kpa AT °C

LOW PRESSURE COIL

Kpa AT °C

CRN# HIGH PRESSURE COIL

CRN# LOW PRESSURE COIL

DWG# HIGH PRESSURE COIL

DWG# LOW PRESSURE COIL

JOB NUMBER

SERIAL NUMBER

DATE MFG.

**C0-000**

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## Vessel Nameplate

Certified By

**RJV****GAS FIELD  
SERVICES**Vegreville, Alberta  
(780)632-7774

Phone

UNIT NAME

M.A.W.P. Internal

AT

DESIGN TEMP

M.A.W.P. External

Kpa.

@

°C

Kpa.

Psi.

@

°F

p.s.i.

MINIMUM DESIGN METAL TEMPERATURE

YEAR BUILT

°C

@

Kpa.

°F

@

p.s.i.

C.R. NUMBER

SERIAL NO.

000000

CORR. ALLOW.

HEAT TREATMENT

HYDRO TEST

mm

Kpa.

p.s.i.

SHELL THICK.

HEAD THICK.

WEIGHT

mm

Top - mm

Bottom - mm

Kg.

SHELL MAT'L

HEAD MAT'L

SIZE

Top-

Bottom-

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## Nonconformity Report

JOB NUMBER:

DESCRIPTION OF NONNCONFORMANCE:

SIGNATURE OF ORIGINATOR:

DATE:

PROPOSED DISPOSITION, REPAIRS OR METHOD OF IDENTIFICATION:

ENGINEERING MANAGER APPROVAL:

DATE:

Q.C. MANAGER APPROVAL:

DATE:

AUTHORIZED INSPECTOR ACCEPTANCE:

DATE:

OWNERS INSPECTORS ACCEPANCE:

DATE:

NONCONFORMANCE RECTIFIED

AUTHORIZED INSPECTOR ACCEPTANCE:

DATE:

Q.C. MANAGER VERIFICATION:

DATE:

OWNERS INSPECTOR ACCEPTANCE:

DATE:

**Hold Tags**

**REASON FOR HOLD**


QUALITY CONTROL INSPECTOR: \_\_\_\_\_

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

**ITEM IDENTIFICATION**

\_\_\_\_\_

**HOLD - DO NOT USE**

SIGNED: \_\_\_\_\_

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

NON-CONFORMANCE REPORT NO.: \_\_\_\_\_

**TO BE REMOVED ONLY BY AUTHORITY OF QUALITY CONTROL MANAGER**



# GAS FIELD SERVICES

4901 Bruce Road, Vegreville, Alberta

Phone: (780) 632-7774

## HEAT TREATMENT INSTRUCTION FORM

CUSTOMER: \_\_\_\_\_ P.O.# \_\_\_\_\_ JOB# \_\_\_\_\_

JOB# \_\_\_\_\_

DESCRIPTION: \_\_\_\_\_

VESSEL S/N \_\_\_\_\_ DIAMETER \_\_\_\_\_

DIAMETER \_\_\_\_\_

LENGTH \_\_\_\_\_ WEIGHT \_\_\_\_\_

MATERIAL \_\_\_\_\_ THICKNESS \_\_\_\_\_

SHELL \_\_\_\_\_

HEADS \_\_\_\_\_

MISC \_\_\_\_\_

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

TYPE OF HEAT TREATMENT REQUIRED: **STRESS-RELIEVING**

### INSTRUCTIONS:

ASME SECTION VIII- DIV- I

P NO: \_\_\_\_\_ MATERIAL \_\_\_\_\_

AMBIENT TO \_\_\_\_\_ °C AT MODERATE RATE

\_\_\_\_\_ °C TO \_\_\_\_\_ °C AT \_\_\_\_\_ °C HOUR

SOAK \_\_\_\_\_ MINUTES AT \_\_\_\_\_ °C ± 15°C

COOL \_\_\_\_\_ °C TO \_\_\_\_\_ °C AT \_\_\_\_\_ °C HOUR

\_\_\_\_\_ °C TO AMBIANT - AIR COOL



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## Welder Qualification Card

Front

**RJV GAS FIELD SERVICES**  
 4001 - 47 Street, Vegreville, Alberta, T9C 1C3  
 Phone: (780) 632-7774

7040  
A.O.Q.P. No.

**WELDING PERFORMANCE QUALIFICATION CARD**

NAME \_\_\_\_\_ FILE NO. \_\_\_\_\_

This card is issued pursuant to the Safety Codes Act and the Pressure Welders' Regulations. The performance qualification is in accordance with Section IX of the ASME Code and subject to the limitations on the reverse side.  
 Valid only if employed with R.J.V. Gas Field Services Ltd.

Date of Test \_\_\_\_\_ Welder's Signature \_\_\_\_\_

Welding Examiner (Print/Type) \_\_\_\_\_ Organization's Card No. **289**

Back

**PERFORMANCE QUALIFICATION**

Process(es) \_\_\_\_\_ Materials (R.No.) \_\_\_\_\_

Filler Metal (R.No.) \_\_\_\_\_ Minimum Diameter \_\_\_\_\_

Max. Deposited Weld Metal \_\_\_\_\_ Position(s) Qualified \_\_\_\_\_

Backing \_\_\_\_\_ Backing Gas \_\_\_\_\_

Progression \_\_\_\_\_

P.Q. Expiry Date \_\_\_\_\_ Welding Examiner Signature \_\_\_\_\_ E-00176  
 Welding Examiner File Number

## Vessel Repair or Alteration Nameplate

<h1 style="color: red; margin: 0;">RJV</h1>		<h1 style="color: red; margin: 0;">GAS FIELD SERVICES</h1>	
Vegreville, Alberta		Phone	
(780)632-7774			
Repair	Alteration	Date work completed	
<input style="width: 100%;" type="text"/>	<input style="width: 100%;" type="text"/>	<input style="width: 100%;" type="text"/>	
M.A.W.P.	TEMP.	Original Serial Number	
<input style="width: 100%;" type="text"/>	<input style="width: 100%;" type="text"/>	<input style="width: 100%;" type="text"/>	
M.D.M.T.	PRESSURE	Job No.	
<input style="width: 100%;" type="text"/>	<input style="width: 100%;" type="text"/>	<input style="width: 100%;" type="text"/>	
C.R. NUMBER	Heat Treatment		
<input style="width: 100%;" type="text"/>	<input style="width: 100%;" type="text"/>		

When an alteration includes a change to the MAWP, design temperature or MDMT, the new values shall be marked on the alteration nameplate and the values that are changed on the original nameplate shall be marked out (i.e., a single horizontal line shall be stamped through the changed value). The following excerpt of markings provides an example of this requirement;

Original nameplate stamping	Rerate nameplate stamping
MAWP <del>4440</del> PSI at 100Deg.F	MAWP 1200PSI at 100Deg.F

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***PRESSURE TEST RECORD***

Date:

Vessel Serial Number:

Vessel Design Pressure:

Hydro Test Pressure:

Temperature:

Test Gauge No.:

Hydro By:

Q.C. Signature:

***Print Clearly***

***Original to be returned to Q.C. on completion of hydro.***

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# COLOR CODE

MATERIAL

COLOR

SA-53- GR.B

RED

SA-106-GR.B

GREEN

SA-333-GR.6

BLUE

SA-516-70

YELLOW

SA-36

WHITE

## NOZZLE MATERIAL IDENTIFICATION

1B - SA-106-B

5B - SA-53-B

15 - SA-105-N

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Drawing Code of Construction Year

Drawing #: V13-418 R3

CRN: V9637.2

Vessel Name: 42" X 10' 1440 psi. Three Phase Vertical

This drawing and the calculations for it have been checked to ASME  
Section VIII Div. 1 Code of Construction for the Edition year listed below:

Checked and approved by: \_\_\_\_\_ for the year: \_\_\_\_\_

Checked and approved by: \_\_\_\_\_ for the year: \_\_\_\_\_

Checked and approved by: \_\_\_\_\_ for the year: \_\_\_\_\_

Checked and approved by: \_\_\_\_\_ for the year: \_\_\_\_\_

Checked and approved by: \_\_\_\_\_ for the year: \_\_\_\_\_

Checked and approved by: \_\_\_\_\_ for the year: \_\_\_\_\_

Checked and approved by: \_\_\_\_\_ for the year: \_\_\_\_\_

Checked and approved by: \_\_\_\_\_ for the year: \_\_\_\_\_

Checked and approved by: \_\_\_\_\_ for the year: \_\_\_\_\_

Checked and approved by: \_\_\_\_\_ for the year: \_\_\_\_\_

Checked and approved by: \_\_\_\_\_ for the year: \_\_\_\_\_

Checked and approved by: \_\_\_\_\_ for the year: \_\_\_\_\_



4901-Bruce Rd. Vegreville, Alberta. Phone :(780) 632-7774

### PIPE THREAD ASSEMBLY DIMENSIONAL REQUIREMENTS

Because of the taper, a pipe can only screw into a fitting a certain distance before it jams, unlike threading a nut on a bolt. The standard specifies this distance, the effective thread (F). It also specifies another distance, the engagement, which is the distance the pipe can be screwed in by hand without much effort. For workers, instead of these distances, it may be more convenient to know how many threads (i.e., turns) to make by hand and how many with a wrench (e.g., provided in the two right columns in the table below).

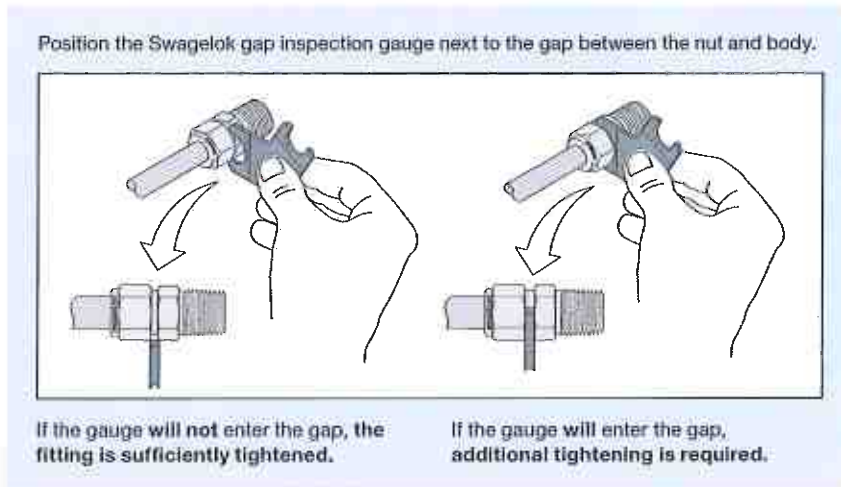
The table shows the distances and number of turns called for in the standard, A tolerance of plus or minus one turn is allowed. All dimensions are in inches except for columns specifying number of threads.

NOMINAL PIPE SIZE (NPS)	NUMBER OF THREADS PER INCH	O.D. OF PIPE "D"	NOMINAL DIA. AT SMALL END OF PIPE "E"	PITCH DIA. AT START OF EXT. THREAD "E"	LENGTH OF EFFECTIVE THREAD EXTERNAL "F"	Example Hand Engagement plus Wrench Makeup Lengths not necessarily equal to Length of Effective Thread			
						LENGTH OF ENGAGEMENT TIGHTENED BY HAND	WRENCH MAKEUP LENGTH	HAND TIGHT THREADS	WRENCH MAKEUP THREADS
1/8	27	0.405	0.3339	0.36351	0.2639	0.18	0.111	4.86	3
1/4	18	.540	0.4329	.47739	.4018	0.200	0.167	3.60	3
3/8	18	.675	0.5676	.61201	.4078	0.240	0.167	4.32	3
1/2	14	.840	0.7013	.75843	.5337	0.320	0.214	4.48	3
3/4	14	1.050	0.9105	.96768	.5457	0.340	0.214	4.75	3
1	11.5	1.315	1.1441	1.21363	.6828	0.400	0.261	4.60	3
1-1/4	11.5	1.660	1.4876	1.55713	.7068	0.420	0.261	4.83	3
1-1/2	11.5	1.900	1.7265	1.79609	.7235	0.420	0.261	4.83	3
2	11.5	2.375	2.1995	2.26902	.7565	0.436	0.261	5.01	3
2-1/2	8	2.875	2.6195	2.71953	1.1375	0.682	0.250	5.40	2
3	8	3.500	3.2406	3.34062	1.2000	0.766	0.250	6.13	2
3-1/2	8	4.00	3.7375	3.83750	1.2500	0.821	0.250	6.57	2
4	8	4.500	4.2344	4.33438	1.3000	0.844	0.250	6.75	2

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## Gaugeability

On initial installation, the Swagelok gap inspection gauge assures the installer or inspector that a fitting has been sufficiently tightened.



⚠ Always depressurize a system before adjusting the tightness of a tube fitting connection.

## Installation Instructions

Swagelok tube fittings 1 in./25 mm and smaller can be installed quickly, easily, and reliably with simple hand tools.

Over 1 in./25 mm sizes require use of a hydraulic swaging unit to swage the ferrules onto the tubing.

### Safety Precautions

- Do not bleed system by loosening fitting nut or fitting plug.
- Do not assemble or tighten fittings when system is pressurized.
- Make sure that the tubing rests firmly on the shoulder of the tube fitting body before tightening the nut.
- Use the correct Swagelok gap inspection gauge to ensure sufficient pull-up upon initial installation.
- Always use proper thread sealants on tapered pipe threads.
- Do not mix materials or fitting components from various manufacturers—tubing, ferrules, nuts, and fitting bodies.
- Never turn fitting body. Instead, hold fitting body and turn nut.
- Avoid unnecessary disassembly of unused fittings.
- Use only long reducers in female Swagelok end connections.

See the instructions starting on the next page for installation of Swagelok tube fittings, O-seal male connectors, caps and plugs, port connectors, tube adapters, positionable elbows and tees, weld fittings, depth marking tool, and preswaging tool.

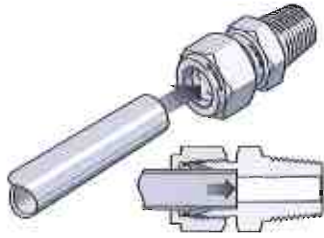
### Tubing Considerations

- Metal tubing material should be softer than fitting material. For example, stainless steel tubing should not be used with brass fittings.
  - When tubing and fittings are made of the same material, tubing must be fully annealed.
  - Always use an insert with extremely soft or pliable plastic tubing.
  - Extremes of wall thickness should always be checked against the suggested minimum and maximum wall thickness limitations.
  - Surface finish is very important to proper sealing. Tubing with any kind of depression, scratch, raised portion, or other surface defect will be difficult to seal, particularly in gas service.
  - Tubing that is oval and will not easily fit through fitting nuts, ferrules, and bodies should never be forced into the fitting.
- See Swagelok *Tubing Data*, MS-01-107, for more information about tubing selection.

## Installation Instructions

### Swagelok Tube Fittings Up to 1 in./25 mm

These instructions apply both to traditional fittings and to fittings with the advanced back-ferrule geometry.



Fully insert the tube into the fitting and against the shoulder; rotate the nut finger-tight.

**High-pressure applications and high safety-factor systems:** Further tighten the nut until the tube will not turn by hand or move axially in the fitting.



Mark the nut at the 6 o'clock position.



While holding the fitting body steady, tighten the nut one and one-quarter turns to the 9 o'clock position.

For 1/16, 1/8, and 3/16 in.; 2, 3, and 4 mm tube fittings, tighten the nut only three-quarters turn to the 3 o'clock position.

### Swagelok Tube Fittings Over 1 in./25 mm

1. Preswage the ferrules onto the tube using a Swagelok multihead hydraulic swaging unit (MHSU).
2. Apply the lubricant packaged with the fitting lightly to the body threads and the rear surface of the back ferrule.
3. Insert the tube with preswaged ferrules into the fitting until the front ferrule seats against the fitting body; rotate the nut finger-tight.
4. Mark the nut at the 6 o'clock position.

5. While holding the fitting body steady, tighten the nut one-half turn to the 12 o'clock position.

Use the Swagelok MHSU gap inspection gauge to ensure that the fitting has been tightened sufficiently.

### Reassembly—All Sizes

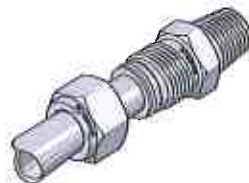
You may disassemble and reassemble Swagelok tube fittings many times.

**⚠ Always depressurize the system before disassembling a Swagelok tube fitting.**



Prior to disassembly, mark the tube at the back of the nut; mark a line along the nut and fitting body flats.

Use these marks to ensure that you return the nut to the previously pulled-up position.



Insert the tube with preswaged ferrules into the fitting until the front ferrule seats against the fitting body.

**Over 1 in./25 mm sizes:** If needed, reapply lubricant lightly to the body threads and the rear surface of the back ferrule.



While holding the fitting body steady, rotate the nut with a wrench to the previously pulled-up position, as indicated by the marks on the tube and flats. At this point, you will feel a significant increase in resistance. Tighten the nut slightly.

**⚠ Do not use the Swagelok gap inspection gauge with reassembled fittings.**

### O-Seal Male Connectors

1. Turn the O-seal connector into the female end until it is finger-tight.
2. Tighten the O-seal connector until it makes metal-to-metal contact with the face of the female end.
3. Tighten slightly with a wrench.

## Installation Instructions

### Caps and Plugs



#### Caps

See Swagelok tube fitting installation and reassembly, page 62.



#### Plugs

While holding fitting body steady, tighten the plug one-quarter turn from the finger-tight position.

*For 1/16, 1/8, and 3/16 in.; 2, 3, and 4 mm tube fittings, tighten the plug one-eighth turn.  
For over 1 in./25 mm tube fittings, tighten the plug one-quarter turn.*

**⚠ Do not use the Swagelok gap inspection gauge with plug assemblies.**

#### Reassembly

You may disassemble and reassemble Swagelok plugs many times. Make subsequent connections by slightly tightening with a wrench after snugging the nut by hand.

### Port Connectors

Connect the machined ferrule end **before** connecting the tube adapter end.

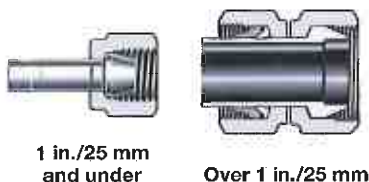
#### Machined Ferrule End

1. Remove the nut and ferrules from the Swagelok end connection. Discard the ferrules.



2. Slip the nut over the machined ferrule end of the port connector.

**Over 1 in./25 mm sizes:** The nut is preassembled on the port connector.



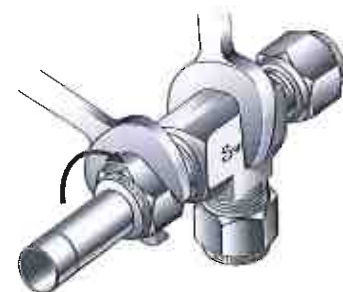
3. Insert the port connector into the end connection and finger-tighten the nut.



4. While holding fitting body steady, tighten the nut one-quarter turn.

*For 1/16, 1/8, and 3/16 in.; 2, 3, and 4 mm tube fittings, tighten the nut one-eighth turn.*

**⚠ Do not use the Swagelok gap inspection gauge with machined ferrule ends.**



#### Reassembly

You may disassemble and reassemble Swagelok port connectors many times. Make subsequent connections by slightly tightening with a wrench after snugging the nut by hand.

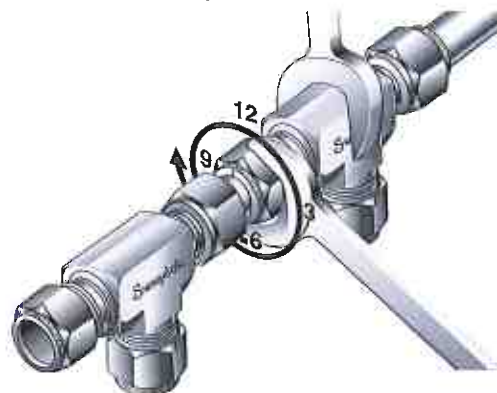
#### Tube Adapter End

5. Insert the tube adapter until it rests firmly on the shoulder of the Swagelok tube fitting body. Finger-tighten the nut.



**Over 1 in./25 mm sizes:** Remove and discard the nut and ferrules from the end connection, then insert the tube adapter.

6. Mark the nut at the 6 o'clock position. While holding fitting body steady, tighten the nut one and one-quarter turns to the 9 o'clock position.



*For 1/16, 1/8, and 3/16 in.; 2, 3, and 4 mm tube fittings, tighten the nut three-quarters turn to the 3 o'clock position.*

*For preswaged over 1 in./25 mm and over tube fittings, tighten the nut one-half turn to the 12 o'clock position.*

**⚠ Do not use the Swagelok gap inspection gauge with preswaged tube adapter connections over 1 in./25 mm.**

#### Reassembly

See Swagelok tube fitting reassembly, page 62.

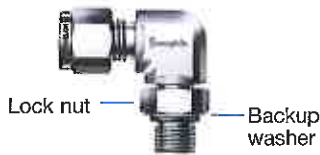
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Swagelok

## Installation Instructions

### Positionable Elbows and Tees



1. Turn the positionable end into the female fitting until the metal backup washer contacts the face of the fitting.
2. Turn the positionable end out of the female fitting (not more than one turn) until the Swagelok tube fitting end is positioned properly.
3. While holding fitting body steady, tighten the lock nut until the metal backup washer contacts the face of the fitting.

### Tube Adapters

Fig. 1



Fig. 2



#### Up to 1 in./25 mm

1. Install the end opposite the tube adapter end (Fig. 1).
2. Insert the tube adapter into the Swagelok tube fitting. Make sure that the tube adapter rests firmly on the shoulder of the tube fitting body and that the nut is finger-tight (Fig. 2).
3. Mark the nut at the 6 o'clock position.
4. While holding fitting body steady, tighten the nut one and one-quarter turns to the 9 o'clock position.

*For 1/16, 1/8, and 3/16 in.; 2, 3, and 4 mm tube fittings, tighten the nut only three-quarters turn to the 3 o'clock position.*

#### Over 1 in./25 mm

Swagelok tube adapters over 1 in./25 mm are furnished with nuts and preswaged ferrules.

To assemble, follow steps 2 through 5 of the Swagelok tube fittings over 1 in./25 mm assembly instructions, page 62.

**⚠ Do not use the Swagelok gap inspection gauge with preswaged tube adapter connections over 1 in./25 mm.**

#### Reassembly

See Swagelok tube fitting reassembly, page 62.

### Weld Fittings

#### Welding Precautions for Swagelok Tube Fittings with Weld End Connections

1. Remove the nut and ferrules.
2. Turn a Swagelok tube fitting plug or another nut onto the fitting so that it is finger-tight. This protects the threads and sealing components.
3. Provide a suitable heat sink to dissipate the heat.
4. Tack weld at four positions 90° apart to hold the fitting in place and to ensure alignment and concentricity of the components.
5. Complete the weld.
6. Remove the plug or nut and replace the nut and ferrules.

**⚠ Caution: When welding carbon steel fittings, the heat often removes the protective oil from the threads. It is important to apply another lubricant, such as Goop™ thread lubricant.**

### Depth Marking Tool

Fig. 1



Fig. 2



1. Insert cleanly cut, fully deburred tube into the depth marking tool (DMT) until the tube is against the shoulder of the tool. Using a pen or pencil, mark the tube at the top of the DMT (Fig. 1).
2. Remove the tube from the DMT and insert it into the Swagelok fitting until it is against the shoulder

of the fitting body (Fig. 2). Rotate the nut finger-tight. If any portion of the mark on the tube can be seen above the fitting nut, the tube is not fully inserted into the fitting.

3. While holding the fitting body steady, follow Swagelok tube fitting installation instructions, page 62.

## Installation Instructions

### Preswaging Tool

Fig. 1



Fig. 2



Fig. 3



1. Install the Swagelok nut and ferrules onto the preswaging tool.
2. Insert the tube into the preswaging tool.
3. Make sure that the tube rests firmly on the shoulder of the preswaging tool body and that the nut is finger-tight.
4. Mark the nut at the 6 o'clock position.
5. While holding the preswaging tool steady, tighten the nut one and one-quarter turns to the 9 o'clock position.  
*For 1/16, 1/8, and 3/16 in.; 2, 3, and 4 mm tube fittings, tighten the nut only three-quarters turn to the 3 o'clock position (Fig. 1).*
6. Loosen the nut.
7. Remove the tube with preswaged ferrules from the preswaging tool. If the tube sticks in the preswaging tool, remove the tube by gently rocking it back and forth. Do not turn the tube (Fig. 2).
8. Insert the tube with preswaged ferrules into the fitting until the front ferrule seats against the fitting body.
9. While holding the fitting body steady, rotate the nut with a wrench to the previously pulled-up position; at this point, you will feel a significant increase in resistance.
10. Tighten the nut slightly (Fig. 3).

**⚠ Do not use the Swagelok gap inspection gauge with fittings that were assembled using the preswaging tool.**



### Tubing Tools and Accessories

For tube benders, tube preparation tools, and tube support systems, see the Swagelok *Tubing Tools and Accessories* catalog, MS-01-179.

### Tubing Products

Swagelok offers a wide variety of tubing products.

Contact your authorized Swagelok representative or see these Swagelok catalogs for more information:

- *Stainless Steel Seamless Tubing, Fractional, Metric, and Imperial Sizes*, MS-01-181
- *Ultra-high-Purity and High-Purity Stainless Steel Tubing, Fractional, Metric, and Imperial Sizes*, MS-01-182.



### Leak Detectors, Lubricants, and Sealants

For liquid leak detectors, lubricants, and sealants, see the Swagelok *Leak Detectors, Lubricants, and Sealants* catalog, MS-01-91.



***Vessel Name Plate Travel Sheet***

Vessel Serial Number:

Vessel Name:

Vessel DWG #:

Vessel C.R.N. #:

Vessel Design Pressure:

Hydro Pressure:

Plate Originator:  Date:

Engraved By:  Date:

Picked Up By:  Date:

***Print Clearly******Original to be returned to O.C.***

Revision 0

Date: July 28, 2011



the pressure equipment safety authority

# Certificate of Authorization Permit

## Quality Management System

Expiry Date: **August 12, 2017**

Reg. No.: **AQP-1129**

**RJV GAS FIELD SERVICES LTD.**

**4901 BRUCE ROAD  
VEGREVILLE, ALBERTA**

having complied with the provisions of the SAFETY CODES ACT, is hereby authorized to perform the activities identified in the following table:

	<u>Construction</u>	<u>Repair</u>	<u>Alter</u>
<b>Pressure Vessels</b>			
ASME Section VIII-1 Pressure Vessels	Shop	Shop/Field	Shop/Field
Miniature Vessels in accordance with CSA B51	Shop	---	---
<b>Indirect Fired Heater Coils</b>			
ASME B31.3 Indirect Fired Heater Coils	Shop	---	---
<b>Pressure Piping</b>			
ASME B31.1 Power Piping	Shop/Field	Shop/Field	Shop/Field
ASME B31.3 Process Piping	Shop/Field	Shop/Field	Shop/Field
<b>Fittings</b>			
Category A,E,H	Shop	---	---

*As a condition of this permit, the holder is required to participate in interim audits by a safety codes officer to verify that the quality management system is being maintained in a manner acceptable to a safety codes officer.*

**Dated at Edmonton, this 8th day of August, 2014**



Chief Inspector and Administrator

**Certificate No.: 10073**