



Retech Systems LLC

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WELDMENT QUALITY ASSURANCE REQUIREMENTS

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Rev.	Description	Date	Approval			
0	Initial Release	6/10/97	BPC			
1	Revised format for clarity. Added section 2 (welding), section 3 (machining), and section 6 (painting). Item 2.1 revised to specify that inside welds will be finished as called out on the drawings. Added Quality Document Package requirement and documentation deliverables, Item 1.2. Added Item 4.2, Record of actual dimensions for tight tolerances. Removed "Retech supplied" from Item 6.2.	2-23-98	BP	KR	BPC	LH
2	Revised paragraph 2.2 in its entirety. Removed names in paragraph 6.6 and added footer notice.	1-21-08				

PREPARED BY Eric Barkhurst Date 01/21/2008

Approvals:

Engineering Manager Robert Cook Date 1/28/08

Operations Manager Mark Carlstedt Date 1-28-08

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WELDMENT QUALITY ASSURANCE REQUIREMENTS

1.0 GENERAL

- 1.1 Weldments as delivered shall conform to all requirements of this specification and Retech drawings as called out on the Retech Purchase Order.
- 1.2 *The vendor shall be required to have an established quality program with designated individual(s) responsible for ensuring that the program is implemented. An example of the Quality Document Package, including the forms to document inspections, non-destructive examinations, testing, and discrepancies must be submitted to Retech for approval prior to any manufacturing. All documents generated during the project under these requirements shall be submitted to Retech as a deliverable.*¹
- 1.3 Any deviations from the specification/drawings must be authorized in writing by the Retech Material Review Board. The vendor will use the Retech V.I.R. Form 099-A-Q001 (attached). VIR authorized changes will be verified during on-site and receipt inspections.

2.0 WELDING REQUIREMENTS¹

- 2.1 *Welding and alignment will be per Retech Workmanship Standards 099-A-W099 and 099-A-W098. Vendor will inspect workmanship per these standards. Inside welds will be ground, blended, sand-blasted, and / or bead-blasted as called out on the drawings.*¹
- 2.2 *Weld procedures and welder qualifications will be per the applicable Retech Systems LLC Workmanship Standards specified and/or ASME Code Section IX (when required).*
- 2.3 *Water jacket openings must be covered to prevent slag, dirt, foreign material, etc. from accumulating in the jacket.*
- 2.4 *Care must be taken to eliminate corners, cracks, crevices, and any places where material may lodge or buildup on the interior surface of the chamber.*

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3.0 MACHINING REQUIREMENTS

- 3.1 *Machining shall be per industry standards using qualified craftsmen.*
- 3.2 *Machining operations shall be performed by machinists trained and experienced with the operation performed and the equipment required.*
- 3.3 *Overheating of material due to excessive tool force, speed / feed rates when removing material is not acceptable.*
- 3.4 *Rework for undersized / oversized dimensions by such methods of surface build-up by overlay with weld material and re-machining is prohibited without approval from Retech's Engineering staff.*
- 3.5 *Machined surface finish requirements shall be provided as specified on the applicable drawings. It is the vendor's responsibility to order material to meet final sizes and surface finishes as stated on the drawings.*
- 3.6 *Water jacket openings must be covered to prevent chips, dirt, foreign material, etc. from accumulating in the jacket.*

4.0 INSPECTION REQUIREMENTS

- 4.1 All dimensional features, surface finishes, special drawing notes, and other applicable specifications must be verified by an inspector, supervisor, or other individual responsible for the quality of the product. This inspection and approval will be documented on supplier format (ex. Certificate of Conformance) and submitted to Retech as a deliverable. Each piece of hardware or part must have documentation which identifies the drawings used for manufacturing and inspection, the date of inspection, and the individual performing the inspection.
- 4.2 *All dimensions with .010 or less tolerancing must be inspected and actual dimensions must be recorded on an approved vendor inspection form.*₁
- 4.3 Retech reserves the right to conduct on-site inspections of welding and machining at the following progress points of the project:
 - 10-15% Completion -- Example: At the completion of sub-components and in-progress layout/tack welding of sub-components into main chamber. This will provide Retech the opportunity to convey our workmanship requirements and provide suggestions to the vendor.
 - 75-80% Completion -- Example: Near completion of fabrication, prior to final machining. This will provide the opportunity to inspect welding and machining to instruct the vendor on any rework that may be required.

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95% Completion -- Example: Completion of fabrication and machining, prior to sandblasting and painting. This will provide the opportunity to conduct final inspection at the vendor's site and would accomplish Retech's receipt inspection other than sandblasting and painting requirements.

Exact inspection points will be determined after each contract has been awarded and the vendor's manufacturing schedule has been reviewed.

- 4.4 Retech representatives shall be afforded right of entry to all areas of the vendor's shop and facilities while the work covered by any Retech contract is in progress. Furthermore, this right shall be provided by all subcontractors executing work for a Retech contract. The vendor shall insure that the Quality Representative is furnished with all necessary facilities, without additional cost, to satisfy the Representative that the work is being satisfactorily performed.

5.0 TESTING

- 5.1 One of two methods of leak testing will be performed and documented by the vendor as agreed upon with the award of the contract.

Method 1: Vendor to conduct a leak test per ASTM standard E515 - 90, Standard Test Method for Leaks Using Bubble Emission Techniques.

As indicated in the standard, the test does not address the safety problems associated with its use. It is the responsibility of the user of the standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

Retech requires that water may not be placed within the jacket.

Retech recommends that the jacket be pressurized to no more than 1/10 of the design pressure during this test. Additionally, we recommend a pressure relief device be used to limit the pressure to no more than 10% above test pressure.

Vendor must provide documentation describing the testing performed, person responsible for test, and date of test.

Method 2: Vendor to conduct vacuum leak testing per Retech workmanship standard 099-A-M007.

Once all leaks have been found and repaired, vendor to conduct hydrostatic testing per Retech workmanship standard 099-A-M006.

Vendor to provide documentation providing person responsible for test and date of test. Retech reserves the right to witness or have a third party witness the performance of these tests.

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6.0 PAINTING, SHIPPING, AND DELIVERABLES,

- 6.1 *Water jackets must be sealed off prior to any sandblasting or painting.*
- 6.2 *The vendor will sandblast the outside of all equipment and paint the outside with 3.0-4.0 mils of paint per Retech workmanship standard 099-A-M020.*
- 6.3 *All exposed machined surfaces shall be coated with a suitable anti-rust compound and covers (i.e. plywood blanks) before shipment. Pipe flanges shall be protected with plywood or metal blind flanges. The supplier shall package pipe threads with plastic end caps or plugs. All applicable openings shall be sealed against entry of water, dirt, or other contaminants during storage, handling, and shipping of equipment.*
- 6.4 *Care must be taken to avoid scarring or damaging the painted finish of the product during the strapping and anchoring of the product for shipping.*
- 6.5 **All** *loads are to be tarped such that all surfaces are protected from damage and rust during transit.*
- 6.6 *Retech QA reserves the right to perform a pre-shipment inspection at the vendor's facility. Vendor will notify Retech's Q.A. Department at least 14 days prior to ship date.*

7.0 RECORDS

N/A

8.0 ATTACHMENTS

N/A

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