

GDLs QUALITY CLAUSES and GDRS QUALITY PURCHASE REQUIREMENTS

**MATERIAL SUPPLIED TO PURCHASE ORDERS MUST BE IN ACCORDANCE WITH THE QUALITY
CLAUSE REQUIREMENTS OUTLINED ON THE PURCHASE ORDER AS FOLLOWS:**

TABLE OF CONTENTS

QUALITY CLAUSES	6
Production Quality Requirements	6
EQD2A.1 (06/01/16) GD Source Inspection.....	6
QG1A.4 (11/21/96) MIL-Q-9858 and ANSI/ISO 9000.....	6
QG2A.4 (11/21/96) MIL-I-45208 and ANSI/ISO 9000.....	6
QG3.3 (7/20/09) GDLS MINIMUM SYSTEM REQUIREMENTS.....	7
QG4.3 (12/21/98) Commercial Requirements.....	7
QG5.2 (04/18/00) C = O Sampling Plan.....	7
QG6.0 (12/21/98) Material Review Board.....	7
QG7.1 (7/22/11) Quality System Certification Requirement.....	7
QG8.0 (1/4/06) Supplemented Material Review Board.....	8
QJ21.2 (01/10/14) Inspection Delegation.....	8
QJ22.0 (12/21/98) Commercial Packing List.....	8
QJ23.0 (01/10/14) Pre-approved Supplier Shipments.....	8
QJ7H.0 (10/5/98) Government GSI.....	9
QJ7M.0 (10/5/98) Merkava Customer Source Inspection.....	9
QJ8M (9/20/2011) Merkava Government Selective Evaluation (Merkava Only) .	10
QJ8.1 (1/18/88) Government Selective Evaluation.....	10
QK9.1 (1/19/99) QAP-Cert (Fill In).....	10
QK10.2 (7/22/11) Ballistic Steel Identification.....	10
QK11.2 (7/20/09) Test Data.....	10
QK12.0 (7/10/09) Engineering Prototype Sample Approval.....	11
QK14.0 (6/30/10) Engineering Prototype Commercial.....	11
QK16 (11/17/04) Key Characteristics.....	11
QK17.0 (4/4/2011) Ballistic Testing, Merkava Armor Castings.....	11
QK18.0 (5/2/2016) Inspection/Test Data Deliverable.....	11
QK48.1 (10/16/12) Critical/Complex Components.....	12
QK49.0 (23/10/15) Supplier Procurement.....	12
QL22.6 (11/23/2015) Fasteners.....	12
QL31.1(7/20/09) Functional Test.....	13
QL41.0 (1/1/86) Inspection Cert - Jan Devices.....	13
QL42.0 (1/1/86) Inspection Cert - Nuclear Hardness.....	13
QL46.0 (7/10/09) CARC Paint Process Certification.....	13
QL512.2 (7/26/00) 11655194 (or) Mil-Std 2000A.....	13
QL52.0 (1/1/86) TT-C-490/MIL-P-16232.....	14
QL6.1 (4/24/88) Consigned Material.....	14
QL81.0 (1/1/86) Radiographic.....	14
QL82.0 (1/1/86) Magnetic Particle.....	14
QL83.0 (1/1/86) Eddy Current.....	14
QL84.0 (1/1/86) Ultrasonic.....	15
QL85.0 (1/1/86) Dye-Penetrant.....	15
QL86.0 (5/13/10) Non Destructive Testing (NDT), Double-V Hull Plates.....	15
QL88.0 (1/19/11) Non Destructive Testing (NDT), Formed Armor.....	15
QP2.2 (1/29/02) Shelf Life Requirement.....	16
QP41.6 (05/09/2007) Traceability - MS Fasteners (CAD).....	16

QP42.1 (4/7/16) Compression Set Test Results.....	16
QP43.2 (11-18-13) Traceability – High Strength Screws	16
QP44.0 (7/10/09) North American High Strength Fasteners	17
QP5.1 (12/7/06) Serialization Requirements	17
QP6.0 (1/1/86) Ordering Data Sheets	18
QP71.0 (1/1/86) Cleaning (SC-X14510).....	18
QP8.0 (7/10/09) Sub-contract Requirements	18
QP9.0 (7/10/09) Re-work Requirements.....	18
QP92.1 (2/24/99) Military Standard Hardware ID	18
QP93.0 (5/1/90) Packing Slip Requirement.....	18
QP94.1 (3/10/14) Foundry Control.....	19
QP95.0 (3/24/15) Item Unique Identification (IUID) per MIL-STD-130.....	19
QP96.0 (9/27/10) Intra-company Sourcing	19
QP97.0 (9/27/10) Incomplete Technical Data – long lead sourcing	19
QP98 (02/15/2017) Electronic Component Packaging	19
QW5.3 (12/7/11) Weld Specimens (MIL)	20
QW51.2 (12/7/11) Weld Specimens (SD-X SPECS)	20
QW52.2 (12/7/11) MIL-STD-1261 OR SD-X12142 MIL-STD-1261:.....	21
QW53.2 (12/7/11) MIL-W-45205 OR SD-X12143 MIL-W-45205:.....	21
QW54.2 (12/7/11) MIL-STD-248 OR SD-X12142 MIL-STD-248:	22
QW55.1 (12/7/11) MIL-STD-1261 OR SD-X12140 MIL-STD-1261:.....	23
QW8.2 (7/18/2012) Merkava Weld Standard 3030	24
QX22.1 (10/16/12) Weldable Appurtenances.....	24
QX23.5 (03/28/2017) Ballistic Steel Welding – GDLS-Canada Weld Standard ..	25
QX24.0 (7/10/09) Weld Inspection	25
QX25.0 (7/10/09) Repair and Overhaul.....	26
QX26.1 (01/16/12) Ballistic/Non-Ballistic Steel Welding.....	27
QX27.2 (01/10/14) Resistance Spot Welding.....	28
QX105.0 (12/7/11) Welding - Independent Test Lab	29
QX106.0 (12/7/11) Welding - JSMC Test Lab.....	29
QX107.0 (12/7/11) Fusion Weld - MIL-STD-2219	29
QX111.3 (12/7/11) Weld Procedure - SD-X12141	30
QX112.6 (12/7/11) Weld Procedure - MIL-W-6858	30
QX113.4 (12/7/11) Weld Procedure - MIL-W-6873	30
QX116.2 (12/7/11) Weld Procedure - MIL-B-12672.....	31
QX117.3 (12/7/11) Weld Procedure - MIL-STD-1941	31
QX118.6 (03/28/17) Commercial Welding	31
QX119.2 (12/7/11) MIL-W-46132 Electron Beam Welding	32
QX1191.0 (12/7/11) AMS 2681 Electron Beam Welding.....	33
QX12.0 (12/7/11) Weld Procedure - MIL-W-8604	33
QX1201.1 (12/7/11) MIL-W-8604AER Requirements.....	34
QX121.0 (09/07/16) Armor Welding (Steel, Aluminum, Titanium) – Excluding Namer, Stryker and LAV Family	34
QX13.4 (12/7/11) Weld Procedure - MIL-W-8611	36
QX14.4 (12/7/11) Weld Procedure - MIL-W-12332	36
QX16.4 (12/7/11) Weld Procedure - MIL-W-45206	37
QX17.4 (12/7/11) Weld Procedure - MIL-W-45210.....	37

QX18.4 (12/7/11) Weld Procedure - MIL-W-46086	38
QX47.0 (4/14/2011) Merkava Paint Application/Painter Qualification	38
QX57.2 (01/10/14) Brazing and Soldering	38
QY11.10 (06/01/16) First Piece Inspection	39
QY2.9 (9/26/01) FAT-QCS-4.....	40
QY2H.2 (9/26/01) First Article Test (HAB)	40
QY3.6 (1/10/08) C.T. - QCS-4A (TDP)	41
QY4.2 (12/15/88) Control Inspection	41
QY-10.1 (7/18/2012) FLOWCHART/CONTROL PLAN (FC/CP)	41
QY14.0 (10/10/11) Merkava First Piece Inspection.....	42
QY15.0 (13/03/15) Material Compliance	42
QY32.0 (7/25/00) Process Certification	43
ENGINEERING QUALITY REQUIREMENTS	44
EQA3 – Quality System	44
EQA4 – Approved Quality System	44
EQB9 – Certificate of Conformance (COC)	45
EQC4 – First Piece Inspection (FPI) Report.....	46
EQC5 – Electrical/Functional Test	47
EQD1 – Acceptance Test Procedure (ATP) & Acceptance Test Report (ATR)...	48
EQD2 – Source Acceptance	49
EQE2 – Automated Test Equipment (ATE) Software Evaluation.....	50
EQF2 – Welding Procedure Specifications (WPS) & Weld Samples	51
EQF3 – Weld Inspection & Welder Certifications	52
EQJ1 – Calibration Certification.....	53
EQK3 – High Strength Fastener Certification.....	53

REVISION HISTORY			
Revision	Description of Change	Author	Effective Date
5/13/10	Initial Release – conversion from web to PDF format	Shellnut	05/13/2010
5/17/10	Added QL86.0 clause and table of contents	Caullay	05/17/2010
5/27/10	Revised QL 86, re-instate QY-10	Caullay	5/27/2010
7/19/10	Various changes in red. Deleted old revisions: QJ7.1, QL22.4, QL512.1, QP2.0, QP2.1, QP41.5, QP43.0, QP5.0, QY2.7, QY2.8, QY2H.IR. Deleted Muskegon clauses: QG5.1, QW7.0 and QW6.0. Added London clauses. Added appendix and removed links in body of document and put in appendix, removed engineering revision date. Change weld submission from 10/6 or 4 weeks to 2 weeks	Gramlich/Shel Inut	07/19/2010
9/30/10	Added QP96.0 and QP97.0, updated QX23.2, QX26.0 and QX118.3 with Canada contact information	Scheffler/Shel Inut	09/30/2010
11/10/10	Update TOC, completely revised GDRS requirements, QL-87 cancelled and removed	Shellnut/GDR S	11/15/2010
12/09/10	Add QW8 clause. added date on footer	Caullay/ Shellnut	12/10/2010
1/5/11	Add QY14	Caullay/ Shellnut	1/05/2011
3/7/11	Revise ROB20 to add 80% life requirement and add ROB36	GDRS	3/7/11
4/4/11	Update QW8 and add new QK17	Caullay/ Shellnut	4/4/11
4/7/11	Update Table of contents	Shellnut	4/7/11
4/20/11	Added QX47	Shellnut	4/20/11

REVISION HISTORY			
Revision	Description of Change	Author	Effective Date
8/4/11	Updates requested per Canada: Clause QG7 has been updated to be consistent within GDLS and reflect the Quality System Certifications for ISO and SAE. The Ballistic Steel clause has been updated to align with revision J of Quality Assurance Directive 25 involving Ballistic Steel Control	Scheffler	08/01/11
8/18/11	Remove *requalify comment from table of comments	Shellnut	8/17/11
8/30/11	Updates per Engineering to revision levels of individual clauses	Bulas/Shellnut	8/30/11
11/1/11	Add clause for Merkava: QJ8M & update QY14.0	Gramlich/Caulley	11/11/11
12/15/11	Added QP98, update welding clauses	Loeffler/Caulley	12/15/11
2/3/12	Removed QP98, added QX27, updated QX26 and QX118 per Canada's request	Scheffler	2/2/12
2/8/12	Updated QY-10 (removed QY-11 reference and replaced with FPI)	Gramlich	2/8/12
2/14/12	Added PQA3000 to QY-10	Shellnut	2/14/12
3/26/12	Added QP-98 and delete EFV clauses	Caulley	3/26/12
6/4/12	update QL-88	Caulley	1/20/2011
7/17/12	Added, QK48.0 and QX57.0, updated QX23.3, QX27.1 and QX118. Update to match GDLS-C Quality Clauses at rev N	Shellffler	7/03/12
7/23/12	Update QW8.2 AND QY-10	Shellnut	7/23/12
11/12/12	Updated QK48, QX22, QX23 & QX57 for Canada	Sheffler	11/12/12
5/30/13	Update per Robotics- ROB 05A. GDLS changed the website address	Jacobs	5/30/13
11/18/13	Updated QP43.2 to include metric and added additional wording for specifications that apply	Caulley	11/18/13
1/10/14	Addition of QJ23, update to QJ21, QX27, QX23, QX57 and QX118 (updates include documentation requirements, welding machines requirements and weld inspector qualifications)	Scheffler	1/10/14
3/10/14	Update clause: EQC1, EQC1ND, EQC7, EQC4ND, QP94 and added new EQF3 and QJ7M.0	Various	3/10/14
6/24/14	Update of Eng. Clauses EQC1, EQC1ND, EQC4, EQC4ND, EQA4, EQC2, EQC2ND, EQC5, EQC5ND	Bulas	7/14/14
3/9/15	Added QY15 at request of London	Scheffler	3/9/15
3/25/15	Update to QP95	Caulley	3/24/15
10/19/15	Added QK49 at request of London	Scheffler	10/19/15
3/22/16	Updated Table of Contents to include QP44 and changes QL22 remove ROB quality clauses	Shellnut/Caulley	4/1/2016
6/21/16	Update to QY11 and EQD2A, QP42 and QK 18	Fadoir/Caulley	6/21/16
2/15/17	Update QP98 and update typo's	Kuhlhoff	2/15/17
3/1/2017	Update for Eng Quality Clauses & Weld clause	Urban/Karas	3/22/17

QUALITY CLAUSES

Production Quality Requirements

EQD2A.1 (06/01/16) GD Source Inspection

General Dynamics Land Systems source inspection/acceptance is required on this order. Supplier shall notify the buyer five (5) working days prior to start of acceptance test or inspection to allow for scheduling of a GDLS quality representative to be in attendance. The supplier shall have technical data (e.g. drawing, QAR, specification, certification, etc.) available for use in support of source inspection.

If supplier-developed automated test software is used as a means of functional product acceptance, the test software (not the firmware) must be approved by GDLS Quality Engineering & Test. Supplier instructions and requirements for test software review and validation are defined in GDLS document QCS-5. The test software shall be submitted to GDLS Quality Engineering & Test for review a minimum of 2 weeks prior to the scheduling GDLS source inspection.

QG1A.4 (11/21/96) MIL-Q-9858 and ANSI/ISO 9000

Supplier must maintain a quality program that meets the requirements of Mil-Q-9858 dated 16 December 1963 with amendment 1, dated 7 August 1981 and Milstd-45662A dated 1 August 1988. Supplier, at their option, may implement the equivalent or better ANSI/ISO series standards (9001, etc) in lieu of the above listed mil spec/std if such implementation is at no additional charge. These programs are subject to approval and/or periodic review by GDLS/government. GDLS contracted suppliers are responsible to document and control any portion of this contract that is performed by them and extend applicable portions of this contract to any tertiary suppliers.

QG2A.4 (11/21/96) MIL-I-45208 and ANSI/ISO 9000

Supplier must maintain a quality control system that meets the requirements of Mil-I-45208, dated 16 December 1963 with amendment 1, dated 24 July 1981 and Mil-STD-45662A dated 1 August 1988. Supplier, at their option, may implement the equivalent or better ANSI/ISO series standard (9001, 9002, etc) in lieu of the above listed Mil Spec/Std if such implementation is at no additional charge. These systems are subject to approval and/or periodical review by GDLS/government. GDLS contracted suppliers are responsible to document and control any portion of this contract that is to be performed by them and extend applicable portions of this contract to any tertiary suppliers.

QG3.3 (7/20/09) GDLS MINIMUM SYSTEM REQUIREMENTS

Supplier must provide and maintain a Quality System that is acceptable to General Dynamics Land Systems and government. In addition, all measuring and test equipment used to inspect the items delivered against this contract shall be calibrated by the supplier utilizing standards whose calibration is certified as being traceable to the National Institute of Standards and Technology. These systems are subject to approval and periodic reviews by GDLS to determine acceptability. GDLS contracted suppliers are responsible to document and control any portion of this contract that is performed by either the contracted supplier or any tertiary supplier. In view of the above contracted suppliers are responsible for extending GDLS contract requirements to any tertiary supplier.

QG4.3 (12/21/98) Commercial Requirements

The products provided shall meet the characteristics of this commercial catalog item, conform to the producer's own drawings, specifications, standards and quality assurance practices and be the same as offered for sale in the commercial market. General Dynamics reserves the right to require proof of such conformance.

QG5.2 (04/18/00) C = O Sampling Plan

Product inspected by a sampling plan for delivery on this purchase order must use an acceptance number zero; i.e. accept on zero defects and reject the lot on one or more defects. AQL's may be used to establish the proper sample size, however, the acceptance number is zero.

QG6.0 (12/21/98) Material Review Board

Limited material review board (MRB) approval is granted on this purchase order. This authority is limited to minor non-conformances that only impact internal supplier drawings. MRB is not allowed for any characteristic or performance requirement which impacts/violates the GDLS drawing package. A quarterly report will be provided to GDLS-SQA summarizing MRB activities and the associated corrective action. Government participation is not required for MRB.

QG7.1 (7/22/11) Quality System Certification Requirement

The supplier must maintain a Quality Management System that is certified to AS9100 or an ISO Quality System Standard such as ISO 9001 or TS16949. The system is subject to approval and/or periodic review by GDLS/Government. GDLS contracted suppliers are responsible to document and control any portion of this contract that is to be performed by them and extend applicable portions of this contract to any tertiary suppliers.

QG8.0 (1/4/06) Supplemented Material Review Board

Limited material review board (MRB) approval is granted on this purchase order. This authority is limited to Class II nonconformance(s) that impact both internal Supplier and GDLS drawings. MRB is only allowed for minor dimensional characteristics which do not impact/violate the fit, form or function of the next higher level assembly or create a deviation to an approved ATP. This MRB authority does not encompass any changes to electronic components or circuitry control devices. A quarterly report will be provided to GDLS-SQA summarizing Class II MRB activities and the associated corrective actions. Government participation is not required for MRB.

QJ21.2 (01/10/14) Inspection Delegation

The supplier shall conduct all required inspections as agreed upon in accordance with supplier instruction contained in GDLS SQA/SCM Procurement Quality Assurance Handbook PQA 3000. The above shall be accomplished through the use of the GDLS approved delegate only who is responsible for the adequacy and accuracy of said inspection. Failure of GDLS to inspect the goods shall not limit any of GDLS's rights as included under the terms and conditions of this contract to recover damages from seller for supply of defective goods. This program is subject to termination with minimum notice for reasons defined in PQA 3000. All specified documents referenced in the purchase order (i.e. certifications, test reports, etc.) are not to be shipped with the product unless required by a quality clause. These records are to be maintained at the supplier's facility, under delegate control, and are subject to GDLS verification upon request. The records must be retained for a minimum of five (5) years after completion of deliveries and payment thereof under this purchase order unless the GDLS PO directs differently. This paragraph takes precedence over remaining quality requirement clauses for data submittals.

QJ22.0 (12/21/98) Commercial Packing List

This is a commercial item procured from a catalog source. The packing list shall state "commercially procured item" boldly in upper case characters on the face of the packing list/shipping document to preclude further inspection by the receiving facility. Failure to mark the packing list as instructed may result in the shipment being inspected and/or rejected at the supplier's expense.

QJ23.0 (01/10/14) Pre-approved Supplier Shipments

The supplier shall conduct all required inspections as agreed upon in accordance with supplier instruction contained in GDLS SQA/SCM Procurement Quality Assurance Handbook PQA 3000. Failure of GDLS to inspect the goods shall not limit any of GDLS's rights as included under the terms and conditions of this contract to recover damages from seller for supply of defective goods. All

specified documents referenced in the purchase order (i.e. certifications, test reports, etc.) are not to be shipped with the product. These records are to be maintained at the supplier's facility and are subject to GDLS verification upon request. The records must be retained for a minimum of five (5) years after completion of deliveries and payment thereof under this purchase order unless the GDLS PO directs differently.

Suppliers will not be required to apply delegation stamp impression on shipper/packing slips for these part numbers, but must maintain GDLS First Piece Inspection approval (SQA Form SQ01a) for all product delivered to GDLS in accordance with Quality Clause QY11.

QJ7H.0 (10/5/98) Government GSI

Government inspection is required prior to shipment from your plant. Upon receipt of this order, promptly notify the government representative who normally services your plant so that appropriate planning for government inspection can be accomplished. In the event the representative or office cannot be located, our purchasing agent should be notified immediately.

QJ7M.0 (10/5/98) Merkava Customer Source Inspection

Israeli Ministry of Defense (IMOD) inspection and acceptance is required prior to shipment from your plant. Your GDLS Buyer must be notified 14 calendar days in advance of your availability to present material for IMOD inspection. All references to calendar days will take into account both parties' national and religious holidays. IMOD will schedule a visit within 7 calendar days following the end of the 14 day notification period of the supplier's availability to conduct the inspection or sooner if mutually agreed. Material presented for inspection must be in batches (defined as quantity of no fewer than 3 sets of the kit) ready for delivery. The scope of the inspection will include review of inspection documentation, verification that configuration changes, if required, have been incorporated, and minimal physical inspection of hardware. For each Part Number defined on this purchase order, records documenting the results of the Control Plan inspections must be provided to IMOD and/or GDLS at acceptance.

No material may be shipped without IMOD acceptance and/or GDLS authorization.

QJ8M (9/20/2011) Merkava Government Selective Evaluation (Merkava Only)

During performance on this order, your quality control or inspection system, manufacturing processes, and the acceptance plan unique to the Merkava product(s) may be subject to review, verification and analysis by authorized Israel Ministry of Defense representatives-Israel Ministry of Defense visits must be coordinated through a GDLS representative. Israel Ministry of Defense release of product prior to shipment is not required unless you are otherwise notified by General Dynamics.

QJ8.1 (1/18/88) Government Selective Evaluation

During performance on this order, your quality control or inspection system and manufacturing processes may be subject to review, verification and analysis by authorized government representatives. Government release of product prior to shipment is not required unless you are otherwise notified by General Dynamics Land Systems purchase order supplement.

QK9.1 (1/19/99) QAP-Cert (Fill In)

Special quality assurance requirements (QAR, QAP, SQAP, SPEC, etc) apply to the item(s) being procured under this contract. The supplier shall have documented objective evidence on file verifying conformance to specific characteristics referenced in the requirement. The objective evidence shall be made available to GDLS on request within a reasonable amount of time.

QK10.2 (7/22/11) Ballistic Steel Identification

This item contains ballistic steel material. Ballistic steel material used in this item, must be sourced from a supplier that maintains ballistic steel plate cutting records. These records must identify the ballistic plate and associated mill certification (heat/melt and slab/plate codes), the part numbers and quantities that were cut from the plate, and the date on which the parts were cut.

Suppliers procuring cut ballistic parts for assemblies, must maintain procurement records indicating the part number, quantities, source and date. Sources used and records kept will be reviewed at First Piece Inspection.

QK11.2 (7/20/09) Test Data

Test Data Submittal Requirement

Supplier shall have on file for each shipment a copy of the actual chemical test results, physical test results and/or test data as required. These results shall be made available to GDLS on request within a reasonable amount of time.

QK12.0 (7/10/09) Engineering Prototype Sample Approval

Supplier shall confirm TDP compliance according to item specific PS-FRM-3.2.55 form provided by buyer. Supporting compliance data shall be submitted prior to material shipment, to the GDLS-C ED&D PA contact identified on the form. Any deviations to the TDP require ED&D PA approval prior to shipment.

QK14.0 (6/30/10) Engineering Prototype Commercial

Items under this Purchase Order do not require GDLS specified quality inspections or documentation submittal. Product shall meet the Technical Data Package (TDP) requirements, and shall be verified according to the supplier's standard quality system requirements. GDLS reserves the right to require proof of such conformance. Any deviations to the TDP require ED&D PA approval prior to shipment.

QK16 (11/17/04) Key Characteristics

Attributes identified as Key Characteristics shall demonstrate a process capability of 1.33 Cpk or be inspected 100%. The supplier shall have documented objective evidence on file which supports the process capability of 1.33 or greater, or the actual inspection and/or test data as verification of conformance to the drawing key characteristics. The objective evidence shall be made available to GDLS on request within a reasonable amount of time.

QK17.0 (4/4/2011) Ballistic Testing, Merkava Armor Castings

Ballistic testing shall be conducted in accordance with Standard 2030. The supplier shall provide the GDLS buyer with a schedule for preparation of ballistic test samples in accordance with Standard 2030, including supplier-internal qualifications required prior to ballistic testing. Details on sample submittal (location, dates, etc.), will be provided by the GDLS buyer. GDLS and the Israeli Ministry of Defense (MOD) reserve the right to witness/verify all aspects of the armor qualification process. The supplier will be notified by the GDLS Buyer if this option is exercised.

QK18.0 (5/2/2016) Inspection/Test Data Deliverable

Supplier shall deliver with each shipment a copy of all inspection/test data required by item drawings and/or specifications.

QK48.1 (10/16/12) Critical/Complex Components

GDLS has designated this component as a Critical performance item or complex to manufacture. Supplier may be subject to and must demonstrate compliance with a specific process audit associated with this component.

GDLS will issue a clause approval letter, which is required for First Piece Inspection completion and approval. First Piece Inspection must be completed at the supplier's facility, prior to the acceptance of production material.

QK49.0 (23/10/15) Supplier Procurement

This Item contains components to be sourced by the supplier, to which GDLS quality requirements apply. The First Piece Inspection (FPI) submission for this item must include compliance evidence for all supplier sourced components that have GDLS quality requirements.

QL22.6 (11/23/2015) Fasteners

Use of English series Grade 5, Grade 8 hex, socket head or Metric Series Class 8.8, 10.9 hex head or Class 12.9 socket head fasteners, within products supplied to General Dynamics, must be from a manufacturer approved by GDLS. Socket and hex head fasteners will be plated as specified. Results of required tests shall be maintained on file and available.

Additionally, your receiving inspection criteria, provided by a supplier on the above stated list, shall include a verification of approved logo head markings to a 0.04% AQL sample as outlined in Mil-Std-105, however, acceptance is C=0. Each identifiable lot will then be subjected to laboratory testing as specified in two (2) succeeding paragraphs. Documented evidence shall be made available upon request.

Supplier shall furnish a certification with each shipment including the following:

- Material Chemistry and Core Hardness per Tables 1 and 2 of SAE J-429 (English); or Tables 1A, 1B, and 2 of SAE J1199 (Metric)
- Plating as specified in the purchase order

The laboratory test sampling size shall be performed in accordance with ASTM F1470. When multiple usage of fastener dash numbers and/or manufacturer's head logo markings are utilized, the certification shall reference each type. Laboratory sample testing may be waived (with GDLS prior approval) on assemblies specified on this purchase order if the fasteners used originate from an approved GDLS supplier.

Cap fastener must be identified with proper grade symbol markings and shall be marked with the manufacturer's identification head logo. Subsequent lot shipments covered under this purchase order will be accepted with a copy of the original laboratory test sampling date, providing the fastener manufacturer's logo markings are traceable to the initial certification.

QL31.1(7/20/09) Functional Test

Supplier shall furnish a certification with each shipment to indicate that the test requirements have been complied with and actual tests results are on file and available upon request. Certification must include signature, date and title of responsible supplier representative and specifically identify the shipment it relates to including serial number if applicable, for instance, by reference to the shipper number.

QL41.0 (1/1/86) Inspection Cert - Jan Devices

Supplier shall comply with mil-s-19500 documentation requirements for traceability. Copy of certification of Jan Devices must be maintained on file and be available upon request.

QL42.0 (1/1/86) Inspection Cert - Nuclear Hardness

Supplier shall comply with nuclear hardness requirements specified in the technical data package. All required certification documentation must be maintained on file and be available upon request.

QL46.0 (7/10/09) CARC Paint Process Certification

The CARC process applied to this item requires certification to demonstrate compliance to the TDP requirements. Paint certification requirements as outlined in GDLS-C Form 4707, shall be submitted with FPI/PPAP for GDLS approval.

QL512.2 (7/26/00) 11655194 (or) Mil-Std 2000A

Soldering shall be in accordance with either Mil-Std-2000A, TACOM soldering process specification 11655194, ANSI/J-STD-001B or other commercial soldering standards with the contractor's approval.

QL52.0 (1/1/86) TT-C-490/MIL-P-16232

Supplier shall maintain inspection records indicating quantity accepted/rejected in accordance with MIL-P-16232, DoD-P-16232 and/or TT-C-490. These inspection records shall be traceable to each lot of material so processed and shall be available for GDLS or government review upon request. The pre-production approvals cited are not required to be submitted to GDLS, however, the procedure approval must be documented and maintained at your facility.

QL6.1 (4/24/88) Consigned Material

The supplier shall be required to furnish a certification with each shipment whenever the material furnished by the buyer has been replaced or substituted during the manufacturing operations.

The certification, when required, shall state the material and/or chemical composition of the material substituted and shall include signature, date, and title of supplier representative and specifically identify the shipment it relates to; for instance, by reference to the shipper number.

QL81.0 (1/1/86) Radiographic

Supplier shall control radiographic inspection equipment and personnel, including the certification and qualification to the specification. Records shall be maintained for all personnel certified, indicating the date of certification and objective evidence of examination. Records shall be made available upon request.

QL82.0 (1/1/86) Magnetic Particle

Supplier shall control magnetic particle inspection equipment and personnel, including the certification and qualification to the specification. Records shall be maintained for all personnel certified, indicating the date of certification and objective evidence of examination. Records shall be made available upon request.

QL83.0 (1/1/86) Eddy Current

Supplier shall control eddy-current inspection equipment and personnel, including the certification and qualification to the specification. Records shall be maintained for all personnel certified, indicating the date of certification and objective evidence of examination. Records shall be available upon request.

QL84.0 (1/1/86) Ultrasonic

Supplier shall control ultrasonic inspection equipment and personnel, including the certification and qualification to the specification. Records shall be maintained for all personnel certified, indicating the date of certification and objective evidence of examination. Records shall be made available upon request.

QL85.0 (1/1/86) Dye-Penetrant

Supplier shall control dye-penetrant inspection operations including the certification and qualification to the specification. Records shall be maintained for all personnel certified, indicating the date of certification and objective evidence of examination. Records shall be made available upon request.

QL86.0 (5/13/10) Non Destructive Testing (NDT), Double-V Hull Plates

Supplier shall conduct either dye penetrant inspection (per ASTM E165), or magnetic particle inspection (per ASTM E1444) on the tension side of all formed radii for each item produced. Any indication of a crack shall be cause for rejection. The GDLS buyer shall be notified immediately.

Supplier shall control NDT operations including certification and qualification, as required, to ASTM E165 and/or ASTM E1444. Records shall be maintained for all personnel certified, indicating the date of certification and objective evidence of examination. Records shall be made available upon request.

QL88.0 (1/19/11) Non Destructive Testing (NDT), Formed Armor

If forming is performed following final quenching and tempering operations, the supplier shall conduct either dye penetrant inspection (per ASTM E165), or magnetic particle inspection (per ASTM E1444) of the formed area for each item produced. Any linear indication shall be cause for rejection. The GDLS buyer shall be notified immediately. Supplier shall control NDT operations including certification and qualification, as required, to ASTM E165 and/or ASTM E1444. Records shall be maintained for all personnel certified, indicating the date of certification and objective evidence of examination. Records shall be made available upon request.

QP2.2 (1/29/02) Shelf Life Requirement

The seller shall identify those items and/or assemblies which have a specific shelf life requirement. At a minimal the GDLS part number, date manufactured, shelf life, and HSDS as applicable will be marked on each individual container. Seventy-five percent of the Product(s) shelf life is required upon receipt at GDLS

QP41.6 (05/09/2007) Traceability - MS Fasteners (CAD)

Grade 5/Grade 8 hex head and socket head fasteners, with equivalent Grade 5 and Grade 8 chemistry, shall be purchased directly from only those manufacturers approved by GDLS. Approved manufacturers must supply fasteners of their own manufacture only and are not allowed to procure or supply fastener from any other approved North American manufacturer for subsequent sale to general dynamics.

Fastener supplier shall furnish a certification with each shipment that documents the actual material chemistry, core hardness, or tensile strength (per I or SAE J-429 for hex head or section 3 of FF-S-86E for socket head fasteners) and plating requirements specified in Purchase Order. The laboratory test sampling size shall be performed in accordance with section 7.3 of SAE J-429.

Subsequent lot shipments covered under this purchase order will be accepted with a copy of the original laboratory results provided the fasteners originated from the initial raw material production run.

QP42.1 (4/7/16) Compression Set Test Results

The supplier shall maintain actual compression set test data for each purchase order shipment to General Dynamics Land Systems per the requirement of the applicable material specification. In addition, the specific compression set test results shall be subject to random audits by GDLS at supplier's facility and shall be presented to GDLS representatives upon request.

QP43.2 (11-18-13) Traceability – High Strength Screws

Grade 5 and Grade 8 English series and Metric series Classes 8.8, 10.9, and 12.9 hex head and socket head fasteners shall have documentation confirming the chemical and mechanical properties meet the requirements for heat treated alloy steel as specified in the applicable procurement specification.

Fasteners shall be purchased directly by GDLS or from distributors that purchase directly from manufacturers approved by GDLS. Approved manufacturers must supply fasteners of their own manufacture and are not allowed to procure or supply fasteners from any other manufacturer for subsequent sale to General Dynamics.

Fastener suppliers shall furnish a certification with each shipment that documents the actual material chemistry, core hardness, or tensile strength (per applicable specifications SAE J429, ASTM A354, SAE J1199, ASTM F568M, ASTM A574, ASTM A574M, FF-S-85, or FF-S-86), and finish requirements as specified on the applicable drawing or Purchase Order.

Subsequent lot shipments covered under this purchase order will be accepted with a copy of the original laboratory results provided the fasteners originated from the initial raw material production run.

QP44.0 (7/10/09) North American High Strength Fasteners

All high strength fasteners offered for sale to GDLS-C shall conform to the requirements of Form 4496. Bulk fasteners shall include the Declaration (Form 4496, Appendix A) or Certification (Form 4496, Appendix B) in the FPI/PPAP submission.

Fasteners offered for sale to GDLS-C within assemblies shall conform to the following sections of Form 4496:

- A) No high strength fasteners are contained within the assembly. The FPI/PPAP submission shall include a declaration (Form 4496, Appendix A), or
- B) High strength fasteners are contained within the commercial item assembly. The FPI/PPAP submission shall include a certification (Form 4496, Appendix C) stating that the supplier's quality control system for fasteners meets the intent of Form 4496, section 2.0, or
- C) High strength fasteners are contained within the non-commercial item assembly. The FPI/PPAP submission shall include a certification (Form 4496, Appendix D) stating that the supplier's quality control system for fasteners meets all the requirements of Form 4496, section 2.0.

QP5.1 (12/7/06) Serialization Requirements

Each unit supplied on this purchase order must be permanently marked with a

unique serial number which consists of any combination of numbers and letters. Alpha and numeric letters must be clearly distinguishable (ex. 2 and Z, 1 and I, 0 and O, etc.) The supplier must insure that serial numbers are not duplicated for previous or future shipments of the same part number. The supplier must submit their planned serial numbering sequence to the buyer for approval prior to serial numbers being applied. The numbering sequence must be approved by the buyer on the initial purchase order and for any subsequent purchase order where the supplier intends to change the sequence of serial numbers.

QP6.0 (1/1/86) Ordering Data Sheets

Supplier shall comply with specific ordering data sheet requirements specified in this technical data package.

QP71.0 (1/1/86) Cleaning (SC-X14510)

1. Per paragraph 4.2.2.3 of SC-X-14510 each unit shall be cleaned for compliance to requirements of paragraph 3.2.2.3.

QP8.0 (7/10/09) Sub-contract Requirements

All Quality Requirements of the Statement of Work (SOW) apply to this purchase order.

QP9.0 (7/10/09) Re-work Requirements

Rework product to new condition and upgrade to the specified revision. Any deviations from the specified design configuration will require prior authorization.

QP92.1 (2/24/99) Military Standard Hardware ID

Supplier shall furnish standard hardware to the drawing revision level as indicated in the purchase order and/or technical data/drawing package. If no revision level is specified for technical data/drawing package provided, parts must be supplied to the latest revision level established by design agencies as of the date of this purchase order.

QP93.0 (5/1/90) Packing Slip Requirement

Packing slips must be numbered and depict the following information: Purchase

order number, line item number, quantity, part number, drawing number, revision letter and date, ECP number(s), and waiver number(s) if applicable.

QP94.1 (3/10/14) Foundry Control

Foundry control and production x-ray technique approval is required by GDLS Materials Engineering & Survivability in accordance with paragraph 3.1.8 of specification 12292537. Approval must be obtained prior to initial shipment of castings on this purchase order. Foundry control/production x-ray technique documentation shall be submitted to the GDLS buyer for internal distribution to GDLS Materials Engineering & Survivability.

QP95.0 (3/24/15) Item Unique Identification (IUID) per MIL-STD-130

The supplier shall apply Machine Readable Information (MRI) marking per MILSTD-130 to each item produced. Marking shall include, but not be limited to, manufacturer CAGE code, original part number and serial number (if serialization is required by drawing or specification). The supplier shall demonstrate 2D Data Matrix Symbol readability via a verifiable automatic identification device.

QP96.0 (9/27/10) Intra-company Sourcing

This is a GDLS intra-company purchase order. GDLS manufacturing plant Quality System Requirements apply to the material sourced under this purchase order.

QP97.0 (9/27/10) Incomplete Technical Data – long lead sourcing

Material cannot be delivered under this purchase order. The technical data package is incomplete. Quality Clause requirements will not be assigned until the technical requirements are fully defined, after which the purchase order will be revised.

QP98 (02/15/2017) Electronic Component Packaging

All circuit card components (through-hole and surface mount), including printed wiring boards, shall be packaged per the following specifications:

Surface Mount: All surface mount components shall be packaged in accordance with EIA-481. Parts shall not be supplied in tubes. Any parts supplied on cut tape shall have leader and trailer lengths as specified in EIA-481. Plastic tape is preferred over paper tape. Embossed tape is preferred over punched tape.

Any components requiring larger than **104** mm tape, shall be supplied in a carrier waffle tray per the applicable EIA and JEDEC specifications. **All components shall have vacuum pick-up features (either integral or installed) to support machine placement.**

Through-hole Components: Through-hole components shall **NOT** be provided in bulk packaging. Components are to be supplied tape and reel, tube or tray.

Printed Wiring Boards: All PWBs shall be dry-packaged in accordance with J-STD-033 and not exceed 3 inches in height per package. Panelized boards shall not be broken out.

NOTE: In addition to these requirements, any subordinate requirements (e.g., ESD, Moisture Sensitive) shall also apply as required by the component.

QW5.3 (12/7/11) Weld Specimens (MIL)

Weld specimens shall be furnished to the address listed below at least two (2) weeks in advance of production welding. The specimens are to be fabricated using the submitted welding procedure specification (WPS). Following (WPS) approval, the "weld specimen" and the "approved procedure" will be returned and is to be maintained by the supplier during the terms of the contract. Supplier shall have an approval letter for each specific part number, and shall be presented at the time of first piece inspection. Approval letter(s) are required for first piece inspection acceptance and approval(s). For all parts that have been in continuous production and have not been affected by design changes, resubmission of weld specimens shall not be required unless the previously approved procedure is rejected.

General Dynamics Land Systems Lima Assembly Tank Plant 1161 Buckeye Road Lima, Oh 45804 Attn: Material Control Laboratories

QW51.2 (12/7/11) Weld Specimens (SD-X SPECS)

Weld specimens shall be furnished for new welding procedure specifications (WPS) or when procedure parameters are outside previously approved limits. Weld specimens, as applicable, shall be furnished to the address listed below at least two (2) weeks in advance of production welding. Following (WPS) approval, the "weld specimens and "approved procedure" will be returned is to be maintained by the supplier during the terms of the contract. Supplier shall have an approval letter for each specific part number, and shall be presented at the time of first piece inspection. Approval letter(s) are required for first piece inspection acceptance and approval(s). For all parts that have been in continuous production and have not been affected by design changes, resubmission of weld specimens shall not be required unless the previously approved procedure is rejected.

General Dynamics Land Systems Lima Assembly Tank Plant

1161 Buckeye Road
Lima, Oh 45804
Attn: Material Control Laboratories

QW52.2 (12/7/11) MIL-STD-1261 OR SD-X12142 MIL-STD-1261:

Weld specimens shall be furnished to the address listed below at least two (2) weeks in advance of production welding. The specimens are to be fabricated using the submitted welding procedure specification (WPS). Following (WPS) approval, the "weld specimen" and "approved procedure" will be returned and is to be maintained by the supplier during the terms of the contract. Supplier shall have an approval letter for each specific part number, and shall be presented at the time of first piece inspection. Approval letter(s) are required for first piece inspection acceptance and approval(s). For all parts that have been in continuous production and have not been affected by design changes, resubmission of weld specimens shall not be required unless the previously approved procedure is rejected.

- or -

If SD-X12142 is used for welding:

Weld specimens shall be furnished for new welding procedure specifications (WPS) or when procedure parameters are outside previously approved limits. Weld specimens, as applicable, shall be furnished to the address listed below at least two (2) weeks in advance of production welding. Following (WPS) approval, the "weld specimens" and "approved procedure" will be returned and is to be maintained by the supplier during the terms of the contract. Supplier shall have an approval letter for each specific part number, and shall be presented at the time of first piece inspection. Approval letter(s) are required for first piece inspection acceptance and approval(s). For all parts that have been in continuous production and have not been affected by design changes, resubmission of weld specimens shall not be required unless the previously approved procedure is rejected.

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Lima, Oh 45804
Attn: Material Control Laboratories

QW53.2 (12/7/11) MIL-W-45205 OR SD-X12143 MIL-W-45205:

Weld specimens,(except class b) shall be furnished to the address listed below at least two (2) weeks in advance of Production welding. No specimens shall be

required for "class b". The specimens are to be fabricated using the submitted welding procedure specification (WPS). Following (WPS) approval, the "weld specimens" and "approved procedure" will be maintained by the supplier during the terms of the contract. Supplier shall have an approval letter for each specific part number, and shall be presented at the time of first piece inspection. Approval letter(s) are required for first piece inspection acceptance and approval(s). For all parts that have been in continuous production and have not been affected by design changes, resubmission of weld specimens shall not be required unless the previously approved procedure is rejected.

- or -

SD-X12143:

Weld specimens shall be furnished for new welding procedure specifications (WPS) or when procedure parameters are outside previously approved limits. Weld specimens, as applicable, shall be furnished to the address listed below at least two (2) weeks in advance of production welding. Following (WPS) approval, the "weld specimens" and "approved procedure" will be returned and is to be maintained by the supplier during the terms of the contract. Supplier shall have an approval letter for each specific part number, and shall be presented at the time of first piece inspection. Approval letter(s) are required for first piece inspection acceptance and approval(s). For all parts that have been in continuous production and have not been affected by design changes, resubmission of weld specimens shall not be required unless the previously approved procedure is rejected.

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QW54.2 (12/7/11) MIL-STD-248 OR SD-X12142 MIL-STD-248:

All certification tests shall be performed in accordance with Mil-Std-248 and the certified tests results shall be submitted with the applicable welding procedure specification (WPS) to the address listed below at least two (2) weeks in advance of production welding. Approval requirements and visual criteria shall apply to parts utilizing this specification. Supplier shall have an approval letter for each specific part number, and shall be presented at the time of first piece inspection. Approval letter(s) are required for first piece inspection acceptance and approval(s).

- or -

SD-X12142:

Weld specimens shall be furnished for new welding procedure specifications (WPS) or when procedure parameters are outside previously approved limits. Weld specimens, as applicable, shall be furnished to the address listed below at least two (2) weeks in advance of production welding. Following (WPS) approval, the "weld specimens" and "approved procedure" will be returned and is to be maintained by the supplier during the terms of the contract. Supplier shall have an approval letter for each specific part number, and shall be presented at the time of first piece inspection. Approval letter(s) are required for first piece inspection acceptance and approval(s). For all parts that have been in continuous production and have not been affected by design changes, resubmission of weld specimens shall not be required unless the previously approved procedure is rejected.

General Dynamics Land Systems Lima Assembly Tank Plant 1161 Buckeye Road Lima, Oh 45804 Attn: Material Control Laboratories

QW55.1 (12/7/11) MIL-STD-1261 OR SD-X12140 MIL-STD-1261:

Weld specimens shall be furnished to the address listed below at least two (2) weeks in advance of production welding. These specimens are to be fabricated using the submitted welding procedure specification (WPS). Following (WPS) approval, the "weld specimen" and "approved procedure" will be returned and is to be maintained by the supplier during the terms of the contract. Supplier shall have an approval letter for each specific part number, and shall be presented at the time of first piece inspection. Approval letter(s) are required for first piece inspection acceptance and approval(s). For all parts that have been in continuous production and have not been affected by design changes, resubmission of weld specimens shall not be required unless the previously approved procedure is rejected.

or

SD-X12140:

Weld specimens shall be furnished for new welding procedure specifications (WPS) or when procedure parameters are outside previously approved limits. Weld specimens, as applicable, shall be furnished to the address listed below at least two (2) weeks in advance of production welding. Following (WPS) approval, the "weld specimens" and "approved procedure" will be returned and is to be maintained by the supplier during the terms of the contract. Supplier shall have an approval letter for each specific part number, and shall be presented at the time of first piece inspection. Approval letter(s) are required for first piece inspection acceptance and approval(s). For all parts that have been in continuous production and have not been affected by design changes,

Resubmission of weld specimens shall not be required unless the previously approved procedure is rejected.

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Attn: Material Control Laboratories

QW8.2 (7/18/2012) Merkava Weld Standard 3030

All welding shall be performed in accordance with Standard 3030 to the specific Grade specified. If no specification or Grade is specified, welding shall be performed to Standard 3030, Grade 4. All weld symbology shall be interpreted to ISO2553. Unless otherwise specified, fillet weld size shall be interpreted as “a” (throat). Certification tests referenced in Standard 3030 and the welding procedure specification, weld specimens and test report shall be submitted to the address listed below per the 3-stage process outlined in Standard 3030, prior to initiation of production welding. Welders shall be qualified in accordance with Standard 3030, and all applicable welder certification/recertification shall be maintained throughout the production build. Welders’ certifications shall be attached to the welding procedure specification. GDLS and the Israeli Ministry of Defense (MOD) reserve the right to witness/verify all aspects of the weld qualification process. The supplier will be notified by the GDLS Buyer if this option is exercised.

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1161 Buckeye Road
Lima, Oh 45804
Attn: Material Control Laboratories

QX22.1 (10/16/12) Weldable Appurtenances

Item shall be free of mill scale, rust and oil free.

Only water-soluble coolants, tapping fluids, etc. should be used during processing. It is required that these process fluids leave a rust-inhibiting residue when the fluid dries. If hydrocarbon coolants, tapping fluids, etc. are used, they must be followed by a post-cleaning step. The post cleaning step must consist of a hot alkaline cleaner that is based on fatty acids or amines.

Packaging must be accomplished in such a way that rusting will be minimized. Examples are sealed plastic bags in boxes, or wax-lined boxes.

QX23.5 (03/28/2017) Ballistic Steel Welding – GDLS-Canada Weld Standard

Only suppliers approved to perform ballistic welding by GDLS-C are permitted to weld ballistic assemblies in accordance with this clause. Approved suppliers must undergo an annual audit, performed by GDLS-C Quality Engineering, to maintain certification status. Weld joints within this assembly are to be qualified, implemented, and inspected in accordance with the current version of the GDLS-C Weld Manual 10703626.

Drawings which do not reference 10703626 must be reviewed/approved by GDLS-C Engineering prior to welding armour steel. For weld joints which do not contain armour steel, refer to Quality Clause QX118 or consult the GDLS-C contact at ppap.fpi@gdls.com.

Only welders with a current GDLS-C D-0040 Weld Certification may weld this material. Weld inspectors responsible for acceptance or rejection of material and workmanship must be trained and certified in accordance with the GDLS-C Weld Inspection Training Program. Each GDLS-C weld inspector certificate is valid for a 5 year period.

These weld inspectors shall also hold current certification to one of the following options:

- (1) Certification as an AWS Certified Welding Inspector (CWI) in conformance with the provisions of AWS QC1, *Standard for AWS Certification of Welding Inspectors*, or
- (2) Qualification by the Canadian Welding Bureau (CWB) in conformance with the requirements of the Canadian Standard Association (CSA) Standard W178.2, *Certification of Welding Inspectors*, with the exception that a Level I weld inspector must work under the supervision of a Level II or III weld inspector whom is also certified in accordance with the GDLS-C Weld Inspection Training Program.

GDLS-C or GDLS-JSMC approval letter(s) are required for First Piece Inspection (FPI) acceptance and approval(s). Supplier shall have an approval letter for each specific part number or applicable down component, at the time of FPI in accordance with Quality Clause QY11. The supplier shall submit a weld Certification/Warrant for each first new part produced to the address listed below. GDLS-C or GDLS-JSMC will respond with a Weld Approval Letter for inclusion in the FPI.

Heat Affected Zone Criteria (HAZ): The rework or addition of any ballistic weld joint outside of the print specified location is not permitted; the supplier shall consult GDLS for MRB approval prior to any such rework. Rework examples include but are not limited to: mislocated / translated appurtenances or welds, stray welds, arc strikes, and additional welds not mandated by the TDP.

GDLS-Canada Originating Contracts/Purchase Orders Emails: ppap.fpi@gdls.com (Canada) Subject: QX23, Part Number, Part Revision. PO Number

GDLS-SHC/JSMC Originating Contracts/Purchase Orders Emails: weldlab@gdls.com (USA) Subject: Part Number, Part Revision, PO Number

QX24.0 (7/10/09) Weld Inspection

- 1) All welds on items in this contract shall be visually inspected by Certified AWS or CWB Welding Inspectors. Weld inspectors shall:

- i. Hold current or previous certification as an AWS Certified Welding Inspector (CWI) in conformance with the provisions of AWS QC1 (Standard and Guide for Qualification of Welding Inspectors).
or
- ii. Hold current or previous certification by the Canadian Welding Bureau (CWB) in conformance with the requirements of the Canadian Standard Association (CSA) Standard W178.2 (Certification of Welding Inspectors).

Inspection shall be conducted in accordance with the governing weld specification identified in the TDP. When no weld specification is identified the requirements shall be governed by AWS D1.1 for steel, AWS D1.2 for aluminum, or AWS D1.6 for stainless steel. Copies of inspector certifications shall be provided for FPI review; verification inspection reports shall be retained by the contractor and made available upon request.

2) Weld Inspection NDT Quality Control Plan:

Supplier shall develop an NDT Quality Control Plan to be submitted with FPI. Welds on items shall be verified by Liquid Penetrant Testing. Penetrant testing shall be conducted in accordance with ASTM E 165 (Standard Test Method for Liquid Penetrant Examination) and ASTM E 1417 (Standard Practice for Liquid Penetrant Testing). Personnel performing penetrant testing shall be qualified in conformance to SNT-TC-1A, Mil-Std-410, NAS410, or ANSI/ASNT CP-189, and be certified to NDT Level II. Personnel performing penetrant inspection need not be certified under AWS QC1 or CSA W178.2. Copies of personnel certifications shall be provided for FPI review; penetrant testing reports shall be retained by the contractor and made available upon request.

Magnetic Particle Testing may be conducted in lieu of penetrant testing, subject to GDLS approval. Magnetic particle inspection shall be conducted in accordance with ASTM E 1444 (Standard Practice for Magnetic Particle Examination).

QX25.0 (7/10/09) Repair and Overhaul

This clause applies to customer owned material for Repair Only. Upon completion of repair, the supplier shall return the item, together with:

- A) a report indicating work performed to bring material to usable condition.
- B) a Certificate Of Conformance indicating compliance to specification(s) and completion of repaired item functional testing to original test procedure(s).

- C) appropriate test results and/or measurements supporting requirement (b) above shall be submitted with the shipment, unless otherwise specified.

Shipments must include the documentation required by this clause.

QX26.1 (01/16/12) Ballistic/Non-Ballistic Steel Welding

Weld joints within this assembly are to be qualified, implemented, and inspected in accordance with the governing weld specification indicated in the Technical Data Package (TDP). Cancelled, replaced or inactive welding specifications, (eg. MIL-STD-1261, MIL-STD-1941) shall refer to the latest released specification indicated on the cancellation notice (eg. TACOM Ground Combat Vehicle Welding Code 12479550), unless otherwise specified by GDLS-C.

A weld qualification data package consisting of the following elements shall be maintained by the supplier. Minimum data package requirements shall be furnished to the appropriate client address listed below, at least two (2) weeks in advance of production welding. Welder qualification records must include a current TACOM 12479550 or GDLS-C weld lab certification.

If GDLS-C weld manuals are utilized, a Weld Verification Record (form GDLS-C 4426) must be submitted for the applicable joint types. These weld joints shall be verified in accordance with the GDLS-C weld manual requirements. The form must indicate the welder who performed the weld and the date the samples were tested. The weld verification record is valid for one year from the test date.

GDLS-C approval letter(s) are required for first piece inspection acceptance and approval(s). Supplier shall have an approval letter for each specific part number or applicable down component, at the time of first piece inspection in accordance with Quality Clause QY11.

The weld qualification data package shall contain at a minimum:

1. Weld Procedure Specification (WPS).
2. Procedure Qualification Record (PQR) with accompanying test results or Weld Verification Record form GDLS-C 4426
3. Welder Qualification Records.
4. Weld map, detailing which WPS(s) apply to which weld joints.

The following elements shall be provided upon request:

5. Visual inspection criteria/instructions in place.
6. Weld re-work instructions in place.
7. First off weld specimens representative of production welding.

Heat Affected Zone Criteria (HAZ): The rework or addition of any ballistic weld joint outside of the print specified location is not permitted; the supplier shall consult GDLS for MRB approval prior to any such rework. Rework examples

include but are not limited to: mislocated / translated appurtenances or welds, stray welds, arc strikes, and additional welds not mandated by the TDP.

GDLS-C Originating Contracts
Email: ppap.fpi@gdls.com
Subject: <i>Part Number, Part Revision, PO number</i>

QX27.2 (01/10/14) Resistance Spot Welding

Resistance spot weld joints within this assembly are to be qualified, implemented, and inspected in accordance with the Technical Data Package (TDP). When there is no weld specification identified the supplier shall contact the buyer for direction.

When AWS C1.1 applies, the procedure certification test report for each machine used in production shall contain at least two Metallographic tests per AWS C1.1, Clause 4.9. Weld quality evaluation criteria shall be per AWS D8.7, Clause 5. Results shall be recorded within the resistance welding data sheet (Figure 34 of AWS C1.1) and signed/dated by the manufacturer.

A weld qualification data package consisting of the following elements shall be maintained by the supplier. Minimum data package requirements shall be furnished to the appropriate client address listed below, at least two (2) weeks in advance of production welding. Any changes to resistance welding data sheet(s) parameters require resubmission.

Supplier shall have an approval letter for each specific part number, and shall be presented at the time of first piece inspection. Approval letter(s) are required for first piece inspection acceptance and approval(s).

The resistance spot weld data package shall contain at a minimum:

1. Weld Map, detailing which data sheet(s) apply to each weld joint.
2. Resistance Welding Data Sheet(s).
3. Procedure Certification Test Report(s).
4. Machine Qualification Test Report(s), as applicable to TDP.

The following elements shall be provided upon request:

5. Visual inspection criteria/instructions in place.
6. Weld re-work instructions in place.

The weld qualification data package shall be submitted to the appropriate client:

GDLS-C Originating Contracts
Email: ppap.fpi@gdls.com

Subject: QX27, Part Number, Part Revision, PO Number

QX105.0 (12/7/11) Welding - Independent Test Lab

Welding qualified at independent lab: hardware shall be welded using a welding process qualified by General Dynamics as defined in the supplier instructions QCS 83-9 and fabricated in accordance with specification _____. Weld samples shall be submitted to an independent lab for required testing. Supplier shall have an approval letter for each specific part number, and shall be presented at the time of first piece inspection. Approval letter(s) are required for first piece inspection acceptance and approval(s). When the blueprint allows for use of optional specifications only the quality clause for the selected specification shall apply.

QX106.0 (12/7/11) Welding - JSMC Test Lab

Welding qualified at JSMC lab: hardware shall be welded using a welding process qualified by General Dynamics as defined in the supplier instructions QCS 83-9 and fabricated in accordance with specification _____. Weld samples and procedures shall be submitted to GDLS for prior approval. Supplier shall have an approval letter for each specific part number, and shall be presented at the time of first piece inspection. Approval letter(s) are required for first piece inspection acceptance and approval(s). When the blueprint allows for use of optional specifications only the quality clause for the selected specification shall apply.

QX107.0 (12/7/11) Fusion Weld - MIL-STD-2219

Welding procedure specifications (WPS) to be used for production parts against this contract per standard Mil-Std-2219 shall be furnished to the address below for approval at least two (2) weeks in advance of production welding. Supplier shall have an approval letter for each specific part number, and shall be presented at the time of first piece inspection. Approval letter(s) are required for first piece inspection acceptance and approval(s).

General Dynamics Land Systems
Lima Assembly Tank Plant
1161 Buckeye Road
Lima, Oh 45804
Attn: Material Control Laboratories

QX111.3 (12/7/11) Weld Procedure - SD-X12141

Welding procedure specification (WPS) to be used for production parts against this contract per specification SD-X12141 shall be furnished to the address listed below for approval at least two (2) weeks in advance of production welding. Supplier shall have an approval letter for each specific part number, and shall be presented at the time of first piece inspection. Approval letter(s) are required for first piece inspection acceptance and approval(s).

General Dynamics Land Systems
Lima Assembly Tank Plant
1161 Buckeye Road
Lima, Oh 45804
Attn: Material Control Laboratories

QX112.6 (12/7/11) Weld Procedure - MIL-W-6858

Welding procedure specifications (WPS) to be used for production parts against this contract per specification mil-w-6858 shall be furnished to the address listed below for approval at least two (2) weeks in advance of production welding. Supplier shall have an approval letter for each specific part number, and shall be presented at the time of first piece inspection. Approval letter(s) are required for first piece inspection acceptance and approval(s).

General Dynamics Land Systems
Lima Assembly Tank Plant
1161 Buckeye Road
Lima, Oh 45804
Attn: Material Control Laboratories

QX113.4 (12/7/11) Weld Procedure - MIL-W-6873

Welding procedure specifications (WPS) to be used for production parts against this contract per specification MIL-W-6873 shall be furnished to the address listed below for approval at least two (2) weeks in advance of production welding. Supplier shall have an approval letter for each specific part number, and shall be presented at the time of first piece inspection. Approval letter(s) are required for first piece inspection acceptance and approval(s).

General Dynamics Land Systems

Lima Assembly Tank Plant
1161 Buckeye Road
Lima, Oh 45804
Attn: Material Control Laboratories

QX116.2 (12/7/11) Weld Procedure - MIL-B-12672

Welding procedure specifications (WPS) to be used for production parts against this contract per specification mil-b-12672 shall be furnished to the address listed below for approval at least two (2) weeks in advance of production welding. Supplier shall have an approval letter for each specific part number, and shall be presented at the time of first piece inspection. Approval letter(s) are required for first piece inspection acceptance and approval(s).

General Dynamics Land Systems
Lima Assembly Tank Plant
1161 Buckeye Road
Lima, Oh 45804
Attn: Material Control Laboratories

QX117.3 (12/7/11) Weld Procedure - MIL-STD-1941

Welding procedure specifications (WPS) to be used for production parts against this contract per specification mil-std-1941 shall be furnished to the address listed below for approval at least two (2) weeks in advance of production welding. Supplier shall have an approval letter for each specific part number, and shall be presented at the time of first piece inspection. Approval letter(s) are required for first piece inspection acceptance and approval(s).

General Dynamics Land Systems
Lima Assembly Tank Plant
1161 Buckeye Road
Lima, Oh 45804
Attn: Material Control Laboratories

QX118.6 (03/28/17) Commercial Welding

Weld joints within this assembly are to be qualified, implemented, and inspected in accordance with the Technical Data Package (TDP) (Eg., AWS, CSA). When there is no weld specification identified in the TDP, the requirements shall be

governed by AWS D1.1/D1.3 for steel, AWS D1.2 for aluminum, or AWS D1.6 for stainless steel as applicable.

If a weld joint contains armor material, consult the GDLS contact at weldlab@GDLS.com or for GDLS-C purchase orders contact ppap.fpi@GDLS.com. If a weld joint contains Armor material and the drawing is not for the Stryker or the LAV vehicle family, refer to Quality Clause QX121.0 or consult GDLS contact at weldlab@GDLS.com.

The supplier shall develop and maintain a weld qualification data package in accordance with the relevant weld specification. The data package shall be provided to the client address listed below at least two (2) weeks in advance of production welding. The weld qualification data package submitted shall contain at a minimum:

1. Weld Procedure Specification (WPS).
2. Procedure Qualification Record (PQR) with accompanying test results.
3. Welder Qualification Records.
4. Weld map, detailing which WPS(s) apply to each weld joint.
(The following elements shall be provided upon request)
5. Visual inspection criteria/instructions in place.
6. Weld rework instructions in place.

GDLS approval letter(s) are required for First Piece Inspection (FPI) acceptance and approval(s). Supplier shall have an approval letter for each specific part number or applicable down component, at the time of FPI in accordance with Quality Clause QY11.

The weld qualification data package shall be submitted to the appropriate reviewing authority:

General Dynamics Land Systems
Joint Systems Manufacturing Center
Lima, OH 45804
Attn: Material Control Laboratories
Email: weldlab@gdls.com

GDLS-C Originating Contracts/Purchase
Orders
Email: ppap.fpi@gdls.com
Subject: QX118, Part Number, Part
Revision, PO Number

QX119.2 (12/7/11) MIL-W-46132 Electron Beam Welding

A minimum of two (2) weld specimens for each machine using the welding procedure specifications (WPS) as established by the procuring activity per specification MIL-W-46132. The weld specimen and (WPS) shall be forwarded to the address listed below at least two (2) weeks in advance of production welding. Supplier shall have an approval letter for each specific part number, and shall be presented at the time of first piece inspection. Approval letter(s) are required for first piece inspection acceptance and approval(s). A certification

shall be supplied with the initial production shipment indicating compliance to specification MIL-W-46132 and that all data is on file and available upon request. The certification shall include signature, date, and the title of responsible supplier representative, and specifically identify the shipment it relates to, for instance, by reference to the shipper number.

General Dynamics Land Systems
Lima Assembly Tank Plant
1161 Buckeye Road
Lima, Oh 45804
Attn: Material Control Laboratories

QX1191.0 (12/7/11) AMS 2681 Electron Beam Welding

A minimum of two (2) weld specimens for each machine using the welding procedure specifications (WPS) as established by the procuring activity per specification AMS 2681. The weld specimen and (WPS) shall be forwarded to the address listed below at least two (2) weeks in advance of production welding. Supplier shall have an approval letter for each specific part number, and shall be presented at the time of first piece inspection. Approval letter(s) are required for first piece inspection acceptance and approval(s). A certification shall be supplied with the initial production shipment indicating compliance to specification AMS 2681 and that all data is on file and available upon request. The certification shall include signature, date, and the title of responsible supplier representative, and specifically identify the shipment it relates to, for instance, by reference to the shipper number.

General Dynamics Land Systems
Lima Assembly Tank Plant
1161 Buckeye Road
Lima, Oh 45804
Attn: Material Control Laboratories

QX12.0 (12/7/11) Weld Procedure - MIL-W-8604

Welding procedure specification (WPS) to be used for production parts against this contract per specification MIL-W-8604 shall be forwarded to the address listed below at least two (2) weeks in advance of production welding. The (WPS) shall include the approval signature of the authorized government representative and objective evidence that the tests specified in "section 4" of MIL-W-8604 were satisfactorily completed. Supplier shall have an approval letter for each specific part number, and shall be presented at the time of first piece inspection.

Approval letter(s) are required for first piece inspection acceptance and approval(s).

General Dynamics Land Systems
Lima Assembly Tank Plant
1161 Buckeye Road
Lima, Oh 45804
Attn: Material Control Laboratories

QX1201.1 (12/7/11) MIL-W-8604AER Requirements

Welding procedure specification (WPS) to be used for production parts against this contract per specification MIL-W-8604AER shall be forwarded to the address listed below at least two (2) weeks in advance of production welding. The (WPS) shall include the approval signature of the authorized government representative and objective evidence that the tests specified in "section 4" of MIL-W-8604AER were satisfactorily completed. Supplier shall have an approval letter for each specific part number, and shall be presented at the time of first piece inspection. Approval letter(s) are required for first piece inspection acceptance and approval(s).

General Dynamics Land Systems
Lima Assembly Tank Plant
1161 Buckeye Road
Lima, Oh 45804
Attn: Material Control Laboratories

QX121.0 (09/07/16) Armor Welding (Steel, Aluminum, Titanium) – Excluding Namer, Stryker and LAV Family

Weld joints within this assembly are to be qualified, implemented, and inspected in accordance with the governing weld specification indicated in the Technical Data Package (TDP). Cancelled, replaced or inactive welding specifications, (eg. MIL-STD-1261, MIL-STD-1941, Ground Combat Vehicle Welding Code-Steel 12479550) shall refer to the latest released specification indicated on the cancellation notice (eg. MIL-HDBK-1941 superseded with MIL-STD-3040), unless otherwise specified by GDLS.

Armor material is classified as any material that is governed by a military or internal GDLS armor material document (eg. MIL-DTL-12560, MIL-A-46100, MIL-DTL-46027). Weld joints within the assembly are to be qualified, implemented,

and inspected in accordance with the current version of the applicable welding specification called out on the TDP.

Contractors are responsible for production weld quality and to ensure proper workmanship practices are being utilized on armor materials. Contractors must be knowledgeable and proficient with applicable welding specifications (ie: Ground Combat Vehicle Welding Code-Steel 12479550 or Ground Combat Vehicle Welding Code-Aluminum 12472301) and are not authorized to subcontract any contracted armor welding.

A weld qualification data package consisting of the following elements shall be furnished as indicated below. The package shall include the name of the welder who performed the welds and the date the samples were tested. GDLS requires armor welding to utilize certain key essential variables and or workmanship practices based upon the type of armor material. GDLS will provide these key essential variables (ie: wire type) along applicable mechanical test data requirements. The contractor shall contact GDLS by emailing weldlab@gdls.com to receive requirements for particular armor material. All applicable documentation shall include date of origin, applicable signatures, and shall include method of configuration control.

The weld qualification data package shall contain at a minimum:

1. Weld Procedure Specification (WPS) including all applicable key essential welding variables (filler wire, wire speed, travel speed, pre-heat, voltage, transfer mode, welding position) as required by applicable welding specification.
2. Procedure Qualification Record (PQR) with accompanying results (eg. X-Ray, Tensile and Bend testing).
3. Weld workmanship sample (macro section) for each unique joint and welding procedure. Joints may be grouped to minimize number of workmanship samples. Contractor shall consult with GDLS to ensure proper grouping. All workmanship samples shall be sent cut and prepared to a sufficient level to validate fusion.
4. Weld map, detailing which WPS(s) apply to each weld joint. Mapping is not required if a single WPS is used to fabricate the entire assembly.
5. Welder qualification test records.
6. Weld inspector qualification, or clarify if third party is being utilized.

The following elements shall be provided upon request:

7. Weld re-work instructions in place.

Welder qualification testing shall utilize applicable armor material for testing; unless authorized by GDLS to allow alternate material. Contractor is responsible to ensure weld inspectors are certified to applicable requirements.

Rework / Repair or addition of any ballistic weld joint outside of the print specified location is not permitted. The supplier shall consult GDLS for MRB approval prior to any rework consideration. Rework examples include but are not

limited to: mislocated appurtenances or welds, stray welds, arc strikes, and additional welds not mandated by the TDP.

Weld procedure documentation and / or specimens shall be furnished for any new welding procedure specifications (WPS) or when essential variables fall outside previously approved limits. Weld specimens shall be furnished to the address listed below at least two (2) weeks in advance of production welding. The specimens are to be fabricated using the submitted welding procedure specification (WPS). Following (WPS) approval; an official GDLS approval letter will be provided and shall be maintained by the supplier during the terms of the contract. GDLS approval and or authorization shall be presented at the time of first piece inspection. Parts that have not been in continuous production for 12 months require a new weld approval. Approval of previous welding procedures do not require resubmission of weld specimens, but require all other applicable documentation.

Joint Systems Manufacturing Center General Dynamics
Land Systems
1161 Buckeye Road
Lima, OH 45804
Attn: Material Control Laboratories

QX13.4 (12/7/11) Weld Procedure - MIL-W-8611

Welding procedure specifications (WPS) to be used for production parts against this contract per specification MIL-W-8611 shall be furnished to the address listed below for approval at least two (2) weeks in advance of production welding. Supplier shall have an approval letter for each specific part number, and shall be presented at the time of first piece inspection. Approval letter(s) are required for first piece inspection acceptance and approval(s).

General Dynamics Land Systems
Lima Assembly Tank Plant
1161 Buckeye Road
Lima, Oh 45804
Attn: Material Control Laboratories

QX14.4 (12/7/11) Weld Procedure - MIL-W-12332

Welding procedure specifications (WPS) to be used for production parts against this contract per specification MIL-W-12332 shall be furnished to the address listed below for approval at least two (2) weeks in advance of production welding. Supplier shall have an approval letter for each specific part number, and shall be presented at the time of first piece inspection. Approval letter(s) are required for first piece inspection acceptance and approval(s).

General Dynamics Land Systems
Lima Assembly Tank Plant
1161 Buckeye Road
Lima, Oh 45804
Attn: Material Control Laboratories

QX16.4 (12/7/11) Weld Procedure - MIL-W-45206

Welding procedure specifications (WPS) to be used for production parts against this contract per specification MIL-W-45206 shall be furnished to the address listed below for approval at least two (2) weeks in advance of production welding. Supplier shall have an approval letter for each specific part number, and shall be presented at the time of first piece inspection. Approval letter(s) are required for first piece inspection acceptance and approval(s).

General Dynamics Land Systems
Lima Assembly Tank Plant
1161 Buckeye Road
Lima, Oh 45804
Attn: Material Control Laboratories

QX17.4 (12/7/11) Weld Procedure - MIL-W-45210

Welding procedure specifications (WPS) to be used for production parts against this contract per specification MIL-W-45210 shall be furnished to the address listed below for approval at least two (2) weeks in advance of production welding. Supplier shall have an approval letter for each specific part number, and shall be presented at the time of first piece inspection. Approval letter(s) are required for first piece inspection acceptance and approval(s).

General Dynamics Land Systems
Lima Assembly Tank Plant
1161 Buckeye Road
Lima, Oh 45804
Attn: Material Control Laboratories

QX18.4 (12/7/11) Weld Procedure - MIL-W-46086

Welding procedure specifications (WPS) to be used for production parts against this contract per specification MIL-W-46086 shall be furnished to the address listed below for approval at least two (2) weeks in advance of production welding. Supplier shall have an approval letter for each specific part number, and shall be presented at the time of first piece inspection. Approval letter(s) are required for first piece inspection acceptance and approval(s).

General Dynamics Land Systems Lima Assembly Tank Plant 1161 Buckeye Road Lima, Oh 45804 Attn: Material Control Laboratories

QX47.0 (4/14/2011) Merkava Paint Application/Painter Qualification

Paint shall be applied per Technical Instruction H-103 and/or H-107, as applicable per product drawing. If anti-skid paint is required (H-107), painter qualification shall be in accordance with Standard ORD-BM-9-0004.

QX57.2 (01/10/14) Brazing and Soldering

Brazed and soldered joints within this assembly are to be qualified, implemented and inspected in accordance with the Technical Data Package (TDP) brazing/soldering specification (Eg. AWS C3.4, C3.5, C3.11). When conforming to an AWS specification, qualification shall be in accordance with AWS B2.2/B2.3. When there is no brazing/soldering specification defined in the TDP, the manufacturer or contractor shall contact the buyer for direction.

The manufacturer or contractor shall develop and maintain a qualification data package in accordance with the relevant brazing/soldering specification. The data package shall be provided to the client address listed below at least two (2) weeks in advance of production brazing/soldering. The qualification data package submitted shall contain at a minimum:

1. Brazing/Soldering Procedure Specification(s) (BPS, SPS).
2. Brazing/Soldering Procedure Qualification Record(s) (BPQR, SPQR).
3. Brazing/Soldering Performance Qualification Record(s).
4. Braze/Solder map, detailing which BPS/SPS is applied to each joint.

GDLS-C approval letter(s) are required for first piece inspection acceptance and approval(s). Manufacturer or contractor shall have an approval letter for each specific part number or applicable down component, at the time of first piece inspection in accordance with Quality Clause QY11.

The brazing/soldering qualification data package shall be submitted to the appropriate client:

GDLS-C Originating Contracts
Email: ppap.fpi@gdls.com
<i>Subject: QX57, Part Number, Part Revision, PO number</i>

QY11.10 (06/01/16) First Piece Inspection

A First Piece Inspection (FPI) is required as part of this purchase order. It is the supplier's responsibility to conduct a FPI on one of the first five pieces delivered under this order to verify conformance of all physical, chemical, and test requirements specified as part of this order. Upon completion of the inspection, the supplier shall notify the buyer and/or cognizant GD SQA representative. Objective evidence of this requirement shall be available and verified by GD prior to commencing shipments on this order. Five working (5) days notice shall be required for scheduling verification via www.gdls.com (reference PQA3000 for instructions). If supplier-developed automated test software is used as a means of functional product acceptance, the test software (not the firmware) must be approved by GDLS Quality Engineering & Test. Supplier instructions and requirements for test software review and validation are defined in GDLS document QCS-5. The test software shall be submitted to GDLS Quality Engineering & Test for review a minimum of 2 weeks prior to the scheduled FPI. In the case of distributors, the requirement can be considered satisfied by presenting the GD SQA representative with a certificate of conformation from the manufacturer as long as it states objective evidence is on file and available. Manufacturers of QPL parts are only required to produce evidence of current qualifications for QPL parts. FPI is considered satisfied if the purchase order has an active line item for a first article inspection or it has been completed as part of the first article test requirements.

FPI approval is considered extended by GD from one purchase order to the next provided that:

1. No configuration changes have occurred.
2. The part is manufactured at the same facility.
3. The manufacturing process has remained the same.
4. There has been no more than a one (1) year break in production.
5. No formal corrective action has been required.
6. The sub-tier suppliers and special process(es) have not changed.

SQA must be notified if any of the above conditions cannot be met. Objective evidence must be maintained demonstrating the above.

QY2.9 (9/26/01) FAT-QCS-4

The supplier shall obtain First Article Approval (FAA) for this assembly or its subcomponents when a line item is included on this Purchase Order that requires the delivery of the final test report. The absence of this line item indicates that no FAA has been contracted or is required for this Purchase Order and a previous approval satisfies the Technical Data Package (TDP) requirements for FAA. First Article Approval will be granted upon successful completion of a First Article Inspection (FAI) and a First Article Test (FAT). Shipments under this Purchase Order prior to FAA are not allowed. FAI and FAT shall be conducted in accordance with the requirements of the TDP drawing, QAR/QAP, production function/fabrication specification and/or military specification and this Purchase Order. Additional supplier instructions for FAI are contained within GDLS Supplier Instruction QCS 83-4 revision "F" dated July 2000 and for FAT within QCS-4 dated August 2001. Test sample selection shall be accomplished under the supervision of the Government. Government notification is required to allow test monitoring prior to test start (reference QCS-4, Section 4.2.1). Within 30 days of receiving the FAA requirement notification by activation of the FAA Purchase Order line item you must notify the GDLS Buyer of the test facility name, location, contact, phone number and purchase order/work authorization number.

QY2H.2 (9/26/01) First Article Test (HAB)

(This quality clause is unique to the components supporting the heavy assault bridge (HAB) low rate initial production (LRIP) contract only). The supplier shall obtain first article approval (FAA) for this assembly or subcomponents, when a line item is included on this purchase order that requires the delivery of the final test report. The absence of this line item indicates that no FAA has been contracted or is required for this purchase order and a previous approval satisfies the TDP requirements for FAA. First article approval will be granted upon successful completion of a first article inspection (FAI) and a first article test (FAT). Shipments under this purchase order prior to first article approval are not allowed unless otherwise authorized by the procuring activity. FAI and FAT shall be conducted in accordance with the requirements of the technical data package (TDP) (drawing, QAR, production specification and or military specification) and this purchase order. Additional supplier instructions for FAI are contained within GDLS supplier instructions QCS 83-4 revision "F", dated July 2000, except section v, paragraph A. Instead, the first two (2) production pieces produced will be the FAI samples. Likewise for FAT within QCS-4, dated August 2001, except paragraphs 6.1 and 6.3. Instead the first two (2) production pieces produced will be new FAT samples, no destructive testing will be performed, and the FAT samples will be used in production upon successful

completion of testing.

Within thirty (30) days of receiving the FAA requirement notification, by activation of the FAA purchase order line item, supplier must notify the GDLS buyer of the test facility name, location, contact, phone number and purchase order/work authorization number.

QY3.6 (1/10/08) C.T. - QCS-4A (TDP)

Supplier shall conduct control test examinations on this item or its subcomponents

in accordance with the requirements of the technical data package when a control test line item is included on this Purchase Order that requires the delivery of the final test certification. The absence of this line item indicates that no control test has been contracted or is required for this Purchase Order. Specific supplier instructions and requirements for control test (s) and reports are contained within the attached QCS-4A. Hardware shipment prior to control test approval is not allowed.

QY4.2 (12/15/88) Control Inspection

Control inspection required on a lot-by-lot basis for dimension and/or performance characteristics imposed per specific requirements of (_____). Frequency of inspection or test, inspection method and inspection results shall be documented and supplied with each hardware shipment to GDLS receiving plant.

QY-10.1 (7/18/2012) FLOWCHART/CONTROL PLAN (FC/CP)

Prior to First Piece Inspection (FPI) a Process Flow Chart/Control Plan (FC/CP) is to be developed. A suggested sample format can be found in the PQA3000 or the supplier may use an existing format. This document is to be attached and submitted with the FPI request form (please refer to PQA3000). The request for FPI will not be processed without this document being completed. The FC/CP must provide a logical representation of the manufacturing process flow and process control points. This document can be used as an aid for work station development, identifying process control points, defining the methods being used at these control points, and must include all key product characteristics such as KPC/QARs/QAPs and all out sourcing identification.

A walk through of the manufacturing process to include a review of the FC/CP and work instructions should be anticipated as a means to validate process requirements. The FC/CP will be used as part of the Process/Product Validation at FPI and on future GDLS audits.

QY14.0 (10/10/11) Merkava First Piece Inspection

A first piece inspection (FPI) is required as part of this purchase order. It is the supplier's responsibility to conduct a FPI on the first five pieces delivered on this order to verify conformance of all physical, chemical, and test requirements specified as part of this order. Upon completion of the inspection, the supplier shall notify the buyer and/or cognizant GD SQA representative. Objective evidence of this requirement shall be available and verified by GD prior to any shipments on this order. A thirty (30) day notice shall be required for scheduling verification.

In the case of distributors, the requirement can be considered satisfied by presenting the GD SQA representative with a certificate of conformation from the manufacturer as long as it states objective evidence is on file and available. Manufacturers of QPL parts are only required to produce evidence of current qualifications for QPL parts.

First piece inspection approval is considered extended by GD from one purchase order to the next provided that:

1. No configuration changes have occurred.
2. The part is manufactured at the same facility.
3. The manufacturing process has remained the same.
4. There has been no more than a one (1) year break in production.
5. No formal corrective action has been required.
6. The sub-tier suppliers and special processors have not changed.

SQA must be notified if any of the above conditions cannot be met. A new or delta FPI may be required if these conditions cannot be met. FPI verification due to a change will be required on one (1) piece in lieu of the five referenced above. Objective evidence must be maintained documenting the above.

QY15.0 (13/03/15) Material Compliance

The Supplier's Part Number **must** be the same as the suggested source on a GDLS vendor item controlled drawing or reflect the part number on the GDLS purchase order. FPI submission only requires a Certificate of Conformance from the supplier that validates the supplier's part number complies with the supplier's own technical data package. Any substituted material will be in violation of the Purchase Order.

QY32.0 (7/25/00) Process Certification

Process and operator certification of the coating system by the procuring activity is required in accordance with specification 12292894, paragraph 3.9. Certification is required prior to processing material on this purchase order. In addition, certification shall be performed prior to the processing of each purchased lot of materials.

ENGINEERING QUALITY REQUIREMENTS

EQA3 – Quality System

Revision: B Date: 1-MAR-17

The suppliers internal Quality System is acceptable for this item. The supplier is not required to have prior approval of their Quality System by General Dynamics Land Systems.

EQA4 – Approved Quality System

Revision: D Date: 1-MAR-17

Requirement Description:

The supplier shall use a Quality System that is approved by General Dynamics Land Systems (GDLS) Quality Assurance for the goods/services to be provided.

Quality System Requirements:

1. If the supplier is third party registered to AS9100, ISO 9001, or TS16949, the supplier shall provide their current registration certificate to GDLS. If the supplier is not currently third party registered, GDLS Quality Assurance will perform a pre/post award assessment to evaluate the supplier's Quality System
2. All measuring and test equipment used for final product acceptance shall be calibrated with certifications traceable to the National Institute for Standards and Technology (NIST)

EQB9 – Certificate of Conformance (COC)

Revision: E Date: 1-MAR-17

Requirement Description:

The supplier shall furnish a COC with each shipment attesting that the goods/services meet all of the Technical Data Package requirements.

COC Requirements:

1. Data supporting the COC shall be kept on file and made available upon request
2. Signature, date and title of the responsible Quality Representative shall be included

Delivery Requirements:

1. The COC shall be delivered with each shipment of the line item or
2. If the requirement is specified as non-deliverable (i.e., EQB9-ND) the COC shall be kept on file and made available upon request

Non-conformance Requirements:

1. All non-conformances shall be dispositioned by GDLS prior to delivery
2. All non-conformances shall be addressed on the GDLS Supplier Quality Material Report (SQMR)
 - a. Link to SQMR: <http://www.gdls.com/suppliers/quality/SQMR-Form.pdf>
3. The dispositioned SQMR shall be included with the COC

EQC4 – First Piece Inspection (FPI) Report

Revision: E Date: 1-MAR-17

Requirement Description:

A complete verification is required to confirm the article being inspected complies with the Technical Data Package requirements identified in the Purchase Order.

FPI Report Requirements:

1. The FPI form shall be IAW SAE Aerospace Standard AS9102 Form 3 or equivalent
2. Annotated/ballooned drawing shall be included
3. All drawing notes and weld symbols shall be addressed
4. All GD&T characteristics including basic dimensions shall be addressed
5. Supporting documentation (i.e., certifications for materials, special processes, etc.) shall be included
6. FPI report(s) shall be included for all sub-assemblies and details
7. Signature, date and title of the responsible Quality Representative shall be included

Delivery Requirements:

1. The FPI report shall be delivered with the first shipment of the line item or
2. If the requirement is specified as non-deliverable (i.e., EQC4-ND) the FPI report package shall be kept on file and made available upon request

Non-conformance Requirements:

1. All non-conformances shall be dispositioned by GDLS prior to delivery
2. All non-conformances shall be addressed on the GDLS Supplier Quality Material Report (SQMR)
 - a. Link to SQMR: <http://www.gdls.com/suppliers/quality/SQMR-Form.pdf>
3. The dispositioned SQMR shall be included with the FPI report

Additional Information:

Dimensional data and certifications are not required for fasteners unless otherwise specified. Data from Coordinate Measuring Machines (CMM) are not a substitute for the FPI report. Casting and forging x-rays shall be kept on file and made available upon request.

EQC5 – Electrical/Functional Test

Revision: E Date: 1-MAR-17

Requirement Description:

The supplier shall perform electrical and/or functional testing and furnish a copy of the results for each end item delivered.

Test Report Requirements:

1. The test data in supplier format shall address all characteristics required by the Technical Data Package and if required traceable by serial number
2. Actual values are required except for those characteristics typically inspected with pass/fail criteria
3. Signature, date and title of the responsible Quality Representative shall be included

Delivery Requirements:

1. The test data shall be delivered with each shipment of the line item or
2. If the requirement is specified as non-deliverable (i.e., EQC5-ND) the test data shall be kept on file and made available upon request

Non-conformance Requirements:

1. All non-conformances shall be dispositioned by GDLS prior to delivery
2. All non-conformances shall be addressed on the GDLS Supplier Quality Material Report (SQMR)
 - a. Link to SQMR: <http://www.gdls.com/suppliers/quality/SQMR-Form.pdf>
3. The dispositioned SQMR shall be included with the test data

EQD1 – Acceptance Test Procedure (ATP) & Acceptance Test Report (ATR)

Revision: G Date: 1-MAR-17

Requirement Description:

The supplier shall develop and submit an ATP for approval prior to the final testing of hardware. A completed ATR shall be provided with each end item delivered.

ATP Requirements:

1. The ATP shall have a unique document number and shall be revision controlled
2. Each test shall be cross referenced to the performance characteristic in the applicable specification or Technical Data Package (TDP)
3. Each performance characteristic shall be addressed with a detailed test method
4. The test data recording format shall be identified (test data sheets are preferred)
 - a. Actual values are required except for those characteristics typically inspected with pass/fail criteria
5. A list of test equipment required to execute the ATP shall be included
6. Diagrams or photographs of the test setup shall be included in the ATP
7. Signature, date and title of responsible Quality Representative shall be included

ATR Requirements:

1. The ATR shall identify the Purchase Order, Part Number and Serial Number if applicable of the end item being delivered
2. A test equipment calibration log shall be included that identifies the nomenclature, serial number and calibration due date
3. Signature, date and title of responsible Quality Representative shall be included

Delivery Requirements:

1. The ATP shall be submitted for approval a minimum of 30 days prior to the first scheduled acceptance test to the following:
GDLS Engineering Quality Assurance (EQA)
c/o the GDLS Buyer identified on the Purchase Order
2. Any revisions to the ATP shall be submitted for approval prior to additional testing
3. EQA written approval of the ATP shall be maintained on file by the supplier
4. The ATR shall be delivered with each shipment of the line item
5. When requested by EQA or otherwise required by the Purchase Order or Subcontract, the ATR shall be delivered electronically (preferably in PDF format) prior to end item acceptance

Non-conformance Requirements:

1. All non-conformances shall be dispositioned by GDLS prior to delivery
2. All non-conformances shall be addressed on the GDLS Supplier Quality Material Report (SQMR)
 - a. Link to SQMR: <http://www.gdls.com/suppliers/quality/SQMR-Form.pdf>
3. The dispositioned SQMR shall be included with the ATR

Additional Information:

GDLS approval of supplier's test procedure does not relieve the supplier from meeting all requirements of the specifications, drawing and other technical data.

EQD2 – Source Acceptance

Revision: D Date: 1-MAR-17

Requirement Description:

General Dynamics Land Systems (GDLS) requires source acceptance to be completed prior to shipment of end item.

Source Inspection Requirements:

1. The supplier shall notify GDLS five business days prior to the start of final acceptance test or inspection to allow for scheduling of the acceptance activity
 - a. Contact either Engineering Quality Assurance (EQA) or the GDLS Buyer identified on the Purchase Order
2. All supporting documentation as required by the Purchase Order, Quality Requirements and any additional Technical Data Package requirements shall be readily available to support the source inspection

EQE2 – Automated Test Equipment (ATE) Software Evaluation

Revision: D Date: 1-MAR-17

Requirement Description:

The supplier shall submit any ATE Software utilized as a means of functional product acceptance for approval prior to final acceptance testing of hardware.

ATE Software Requirements:

1. The ATE Software shall be revision controlled. Revision control procedures are subject to GDLS audit

Delivery Requirements:

1. The ATE Software shall be submitted for approval a minimum of 30 days prior to final acceptance testing of hardware to the following:
GDLS Engineering Quality Assurance (EQA)
c/o the GDLS Buyer identified on the Purchase Order
2. Any revisions to the ATE Software shall be submitted for approval prior to additional testing.
3. EQA written approval of the ATE Software shall be maintained on file by the supplier

Additional Information:

The GDLS evaluation of ATE may include either a line by line review of the source code (or equivalent) or demonstration of the software operation by the supplier.

EQF2 – Welding Procedure Specifications (WPS) & Weld Samples

Revision: D Date: 1-MAR-17

Requirement Description:

The supplier shall submit WPS and weld samples for approval.

WPS & Weld Sample Requirements:

1. WPS and weld samples shall be generated IAW the applicable specification in the Technical Data Package (TDP)
2. Following WPS approval, the weld sample and approval letter for each part number will be returned and shall be maintained by the supplier during the term of the contract
3. WPS and weld samples shall be resubmitted for approval only if the parts have been affected by design changes

Delivery Requirements:

1. WPS and weld samples shall be furnished to the GDLS at the following address a minimum of two weeks prior to welding:
Joint Systems Manufacturing Center (JSMC)
1161 Buckeye Road
Lima, OH 45804
Attn: Material Control Laboratories

EQF3 – Weld Inspection & Welder Certifications

Revision: B Date: 1-MAR-17

Requirement Description:

The supplier shall perform a visual weld inspection and ensure Individual Welder Certification are IAW the applicable weld specifications.

Visual Weld Inspection Requirements:

1. All welds shall be visually inspected and be free of cracks, overlap and undercut IAW the applicable specification in the Technical Data Package (TDP)
2. All welds shall be measured with suitable gages and documented in the First Piece Inspection (FPI) report per EQC4
3. Visual inspection shall be aided by strong light, magnifiers or other equipment as the supplier deems suitable

Welder Certification Requirements:

1. Individual Welder Certifications shall be IAW the applicable specification in the TDP
2. All welding shall be traceable to the certified individuals performing the work
3. Weld records shall be maintained in supplier format and made available upon request

Non-Destructive Test (NDT) Requirements:

1. Any NDT shall be conducted after visual inspection is complete
2. NDT is required when specified by the TDP or may be conducted at the manufacturer's discretion
3. NDT inspection shall be conducted utilizing liquid penetrant per ASTM E1417/E1417M or magnetic particle per ASTM E1444/E1444M with no cracks permissible
4. Personnel performing NDT other than visual inspection shall be a certified:
 - a. NDT Level II inspector or
 - b. NDT Level I inspector working under the supervision of a Level II inspector
5. Personnel performing NDT shall be qualified and certified IAW ASNT Personnel Qualification SNT-TC-1A ANSI/ASNT-CP-189 or NAS 410 for military purposes, or as specified in the contract or Purchase Order

EQJ1 – Calibration Certification

Revision: D Date: 1-MAR-17

The supplier shall furnish a certification including data if available attesting that each item being delivered is calibrated and traceable to the National Institute for Standards and Technology (NIST).

EQK3 – High Strength Fastener Certification

Revision: F Date: 1-MAR-17

Requirement Description:

The supplier shall ensure high strength fasteners are compliant to the Technical Data Package (TDP) for American Grade 5 (BC), Grade 8 (BD) or Metric Classes 8.8, 10.9, 12.9.

High Strength Fastener Requirements:

1. The fasteners shall be traceable to a recognized manufacturing source (as identified by the bolt head logo) that is on the approved GDLS “Process to Supplier List”
 - a. Contact the GDLS buyer identified on the Purchase Order to obtain the list of approved manufacturers

Delivery Requirements:

1. The supplier shall deliver a certification with each shipment that documents the actual material chemistry, core hardness or tensile strength and plating conformance