

**QUALITY CONTROL REQUIREMENTS
FOR SUPPLIERS**

**NORTHROP GRUMMAN SYSTEMS CORP.
SPERRY MARINE
(Afterwards referred to as "Sperry")**

STANDARD QUALITY CLAUSES
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71	MRR authority, Supplier N/A
QR	(Deleted)

STANDARD QUALITY CLAUSES

NOTE: IN ADDITION TO THE APPLICABLE QUALITY CLAUSE(S), THIS PAGE MUST BE PROVIDED TO THE SUPPLIER.

APPLICABILITY

Sperry Quality personnel review Product material and service requirements. Applicable Quality Clauses are designated to become part of the purchase order requirements. Failure to conform to the applicable Quality Clause(s) requirements, and/or failure to provide the required documentation, may result in rejection of the material.

FLOW-DOWN REQUIREMENTS

Unless otherwise specified, the Quality requirements invoked are applicable to all levels of sub-tier contractors.

ORDER OF PRECEDENCE

In the event of a conflict between the text of this document and the references cited herein, or in the purchase order requirements, the following order of precedence shall prevail:

1. The procurement contract
2. The approved drawing, referenced documents/specifications
3. This document (H8291, latest revision)

The requirements of these Sperry Quality Clauses, and any procedures or reports in implementation thereof, **shall be in addition to, and not in derogation of**, other Sperry purchase orders and/or documented contract requirements. Compliance with these clauses does not relieve the Supplier of the responsibility for providing materials and/or services in full compliance with drawing and specification requirements, nor does it guarantee acceptance of materials and services by Sperry. If clarification of a Quality Clause is required, Sperry will provide qualified personnel to advise the Supplier, via the cognizant buyer.

AUDIT/SURVEILLANCE

Sperry may conduct an Audit or perform surveillance of the Supplier Quality Control

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system and manufacturing processes to determine the Supplier's ability to comply with applicable requirements and specifications.

DOCUMENT RETENTION

Unless otherwise specified, the retention period for Supplier/sub-tier contractor supporting documentation shall be four (4) years minimum after completion of the Sperry purchase order requirements.

MATERIAL REVIEW AUTHORITY

The Supplier shall not exercise Material Review authority without written approval of the Sperry Quality Department Manager.

SPECIFICATION REVISION

Unless otherwise specified, the revision of the applicable specification, publication, standard, etc., in effect at the time of issuance of the Sperry purchase order, is applicable to the order.

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CLAUSE 00 NO QUALITY CLAUSES INVOKED

NOTE: Clause 00 replaces Z1 and both are interchangeable.

CLAUSE 01 GOVERNMENT SOURCE INSPECTION REQUIRED (DCMC)

Government source inspection is required **prior to shipment** from the Supplier's facility. Upon receipt of this Sperry purchase order, the Supplier shall promptly notify the government representative who normally services the Supplier's facility, so that appropriate planning for Government inspection can be initiated in a timely manner.

Evidence that the material, or service, has been accepted by the appropriate Government agency shall be provided to Sperry prior to shipment from the Supplier facility.

CLAUSE 02 GOVERNMENT SOURCE INSPECTION REQUIRED (NASA)

All materials, services, and/or processes provided on this Sperry purchase order are subject to inspection and test by the Government at all times, regardless of location. This includes the period during performance. As a minimum, the Government will evaluate the order **prior to shipment from the Supplier facility**. The Government representative who normally services your facility shall be notified three (3) working days in advance of the time articles or processes are scheduled for inspection or test.

CLAUSE 03 SPERRY SOURCE INSPECTION/TEST AT THE SUPPLIER FACILITY

The material, or service, provided on this purchase order is subject to source inspection/test by Sperry representatives at the Supplier's facility, or sub-tier contractor, **prior to shipment**. The Supplier shall notify the Sperry applicable buyer and Quality Assurance five (5) working days in advance of the anticipated source inspection/test date. The Supplier shall insure that the latest applicable drawings, specifications, technical requirements, purchase order information and necessary equipment are available to expedite Sperry evaluation of the material upon arrival.

Unless otherwise specified in the purchase order, Sperry inspection/test at the Supplier facility does not guarantee final acceptance; final acceptance shall be at Sperry.

If the material is not ready for evaluation upon arrival at the Supplier facility, or if there are significant nonconformances, the Supplier may be liable for all expenses incurred by the Sperry surveillance personnel.

Only Sperry Marine Quality Assurance may waive Source Inspection.

CLAUSE 04 MIL-Q-9858 MILITARY SPECIFICATION INVOKED / ISO 9000 or ANSI/ASQC Q9000 SERIES STANDARD

Unless otherwise specified, the requirements of military specification MIL-Q-

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9858, Quality Program Requirements, MIL-I-45208, or applicable ISO 9000 Series Standard, are applicable to the material or services provided on this Sperry purchase order. The supplier shall have a documented policy and documented procedures to implement the requirements of the applicable standard.

NOTE: However, if Mil-Q-9858 is specifically invoked in the customer's contract, another standard cannot be relied upon without the written approval of the Sperry contract administrator.

CLAUSE 05 GOVERNMENT REVIEW OF SUPPLIER PERFORMANCE

During the performance of the requirements of this Sperry purchase order, the Supplier's quality control/inspection system and manufacturing processes are subject to review, verification and analysis by authorized Government representatives. For the purpose of such review, verification or analysis, the Supplier shall provide a copy of the Sperry purchase order to the Government representative upon request.

This does not require that material or product be inspected and released by the Government prior to shipment. Clause 03 shall be invoked for that purpose.

CLAUSE 06 INSPECTION SYSTEM REQUIREMENTS

The Supplier, including sub-tier contractors, shall have a documented quality system. The system must provide adequate control of material or services to determine that they meet the requirements of the purchase order and all relevant specifications. Unless otherwise specified, the Supplier and sub-tier contractors may use one of the ISO-9000 Series standards or MIL-I-45208 as the model for their quality system.

CLAUSE 07 (A) RAW MATERIAL CERTIFICATION - (CASTINGS NOT APPLICABLE)

All shipments of material shall be accompanied by a statement certifying that the material supplied conforms to the requirements of the Sperry purchase order and applicable specifications. The certification shall further state that supporting data is on file either at the Supplier's facility, or at their sub-tier contractors, available to Sperry for review, and will be provided to Sperry upon request. This data shall include the cure date of any natural or synthetic rubber products.

The certification shall contain adequate information for material lot identification (e.g., Sperry purchase order number, part number/revision, quantity supplied, unique lot identification number, serial numbers, type/grade/class/condition of the material, any other pertinent information required for material/lot identification).

CLAUSE 07 (B) CERTIFICATION OF RAW MATERIALS (CASTINGS NOT APPLICABLE)

USE CLAUSE 07 (C)

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CLAUSE 07 (C) QUANTITATIVE RAW MATERIAL CERTIFICATION (CASTINGS NOT APPLICABLE)

All shipments of material shall be accompanied by a report(s) listing the quantitative results of tests required by the Sperry purchase order and/or applicable specifications. As a minimum, this shall include the quantitative results of chemical analysis and mechanical tests.

The certification shall contain adequate information for material lot identification (e.g., Sperry purchase order number, part number/revision, quantity supplied, unique lot identification number, serial numbers, type/grade/class/condition of the material, any other pertinent information required for material/lot identification).

CLAUSE 08 SHIPMENT OF MATERIAL IMPLIES COMPLIANCE. INSPECTION IS REQUIRED

See the Purchase Order notes. The shipment of material implies compliance with all specifications and Purchase Order requirements. Inspection by Sperry is required before acceptance of material.

CLAUSE 08 (A) SHIPMENT OF MATERIAL IMPLIES COMPLIANCE.

See the Purchase Order notes. The shipment of material implies compliance with all specifications and Purchase Order requirements.

CLAUSE 08 (B) CERTIFICATE OF COMPLIANCE/CONFORMANCE (C of C) CUSTOMER REQUIRED

A Certification of Compliance/Conformance, on **Supplier letterhead**, signed by an authorized Supplier representative, and containing the representative's title shall accompany all shipments of material/parts certifying that the material/services supplied to Sperry conform to the requirements of the purchase order and applicable specifications. The certification shall further state that inspection/test data proving compliance to applicable specifications is on file with the supplier or original place of manufacture and subject to review by Sperry.

At the supplier's option, this certificate may be expanded to include other certifications required by the purchase order, such as the certification of mercury exclusion or of RoHS compliance. Each certification should be referenced by name in a separate paragraph. This may enable the supplier to reduce the number of individual documents needed to satisfy purchase order requirements.

The certification shall contain adequate information for material lot identification (e.g., purchase order number, part number/revision, quantity supplied, and any other pertinent information required for material/lot identification).

NOTE: INVOKE ONLY IF CUSTOMER CONTRACT SPECIFICALLY REQUIRES THE DOCUMENT TO BE RETAINED AT SPERRY.

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NOTE: If part traceability is required, QC Clause #48 shall be invoked.

CLAUSE 09 (A) OPTICAL GLASS TEST DATA REQUIRED, QUANTITATIVE

The Supplier shall perform applicable inspection/tests and supply appropriate data in accordance with the requirements of the drawing(s), Engineering Bulletin(s), approved Test Procedures and/or the specific requirements of the Sperry purchase order. As a minimum, the Supplier shall provide the following data to Sperry:

- o Quantitative Glass Material Certifications and Melt Data
- o Interferograms
- o Optical Coating Certification with Quantitative Data
- o Dimensional Inspection Report of Detail/Find Item

The certification shall contain adequate information for material lot identification (e.g., Sperry purchase order number, part number/revision, quantity supplied, unique lot identification number, serial numbers, type/grade/class/condition of the material, any other pertinent information required for material/lot identification).

CLAUSE 09 (B) TEST DATA REQUIRED, QUANTITATIVE

1. Electrical Components, Equipment, Fixtures, etc.

- 1.1 All shipments shall be accompanied by a report listing the quantitative results of tests performed by the Supplier to verify conformance to the Sperry purchase order and applicable specification requirements.

The Supplier shall perform tests specified on drawings, Engineering Bulletins, Acceptance Test Procedures, and any other applicable specifications.

NOTE: Pass/Fail notations indicating your readings are within specification limits, or that tests have been performed satisfactorily, will only be acceptable for tests performed on "GO/NO-GO" type automatic equipment lacking quantitative readout capabilities.

2. Printed Wiring Boards (PWB)

- 2.1 Documentation shall be provided with each lot quantity, identifying the type of test performed, and certifying that the test results are acceptable in accordance with the applicable requirements.

Unless otherwise specified, the Supplier shall perform electrical tests on the PWBs in accordance with the purchase order and/or drawing requirements, Class 3, **NETLIST** or equivalent. If no requirements are specified on the purchase order/drawing, test shall be performed in accordance with IPC-6012, Class 3, **NETLIST** or equivalent.

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NOTE: SELF LEARN or LEARN MODE test is not acceptable without written authorization from Sperry Quality.

3. Components other than electrical

3.1 All shipments shall be accompanied by a report listing the quantitative results of tests performed by the Supplier to verify conformance to the Sperry purchase order and applicable specification requirements.

3.2 The Supplier shall perform tests specified on drawings, Engineering Bulletins, Acceptance Test Procedures, and any other applicable specifications. **Examples of tests requiring documentation are:** results of pressure tests, hardness tests, torque settings, weight, tension tests, etc.

NOTE: Pass/Fail notations indicating your readings are within specification limits, or that tests have been performed satisfactorily, will only be acceptable for tests performed with "GO/NO-GO" type equipment.

NOTE: The certification shall contain adequate information for material lot identification (e.g., Sperry purchase order number, part number/revision, quantity supplied, unique lot identification number, **serial numbers, date codes**, type/grade/class/condition of the material, any other pertinent information required for material/lot identification).

CLAUSE 09 (C) INSPECTION DATA REQUIRED, QUANTITATIVE

The Supplier shall perform physical inspection of the applicable material in accordance with requirements of the Sperry purchase order and applicable specifications. The Supplier shall provide data as follows:

- o Quantitative data when actual values are checked
- o When applicable, Go/No-Go checks shall be identified (e.g., standard size bores, threads checked with Go/No-Go thread gages, etc.)

The certification shall contain adequate information for material lot identification (e.g., Sperry purchase order number, part number/revision, quantity supplied, unique lot identification number, **serial numbers, date codes**, type/grade/class/condition of the material, any other pertinent information required for material/lot identification).

CLAUSE 09 (D) TEST DATA REQUIRED, QUANTITATIVE - maintained on file

All of the requirements of Clause 09(B) are invoked except that the data may not be submitted with parts. Inspection/test data proving compliance to applicable specifications is on file with the supplier or original place of manufacture and subject to review by Sperry. Data must be retained a minimum of one year from the date shipment.

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QC CLAUSE 10(var.)**NON-NUCLEAR SUBSAFE LEVEL I
MATERIAL/PROCESS CERTIFICATION****GENERAL REQUIREMENTS**

Due to the critical application of Non-Nuclear Subsafe Level I material, documentation must be absolutely traceable to the material it represents and shall be maintained and provided to Sperry. It shall attest to the material identification and processes, providing maximum confidence in the integrity and quality of the material. All raw material and finished product shall be marked with the unique heat, lot, and/or traceability number(s) in accordance with purchase order, drawing and/or specification requirements. When the part is too small for marking, or the features of the part do not allow marking (e.g., 16 u/in finish), the parts shall be tagged for absolute identification.

CLAUSE 10 (A) **RAW MATERIAL CERTIFICATIONS - SUBSAFE LEVEL I OBJECTIVE
QUALITY EVIDENCE (CASTINGS N/A)**

**QUANTITATIVE CHEMICAL/MECHANICAL/PROCESS DATA: INCLUDES
FORGINGS, SPECIAL MATERIALS/PARTS**

1. SPECIFIC REQUIREMENTS

1.1 As a minimum, the following documentation shall be provided to the Sperry Quality department, via the applicable buyer, for review and written approval **prior to shipment** of any raw material or finished product. Unless otherwise specified, the documentation shall conform to the minimum data requirements of DI-MISC-81020 and all applicable specifications. Supplier certifications may vary from the sample certification format contained in DI-MISC-81020, however, the minimum data content is applicable.

- o Quantitative results of chemical analysis
- o Quantitative results of mechanical tests
- o Quantitative data and results of any material processes (e.g., heat treat, plating, etc.)
- o Statement of compliance on the certifications stating that the data/material conforms to specification requirements
- o Other data pertinent to the identification, traceability and/or condition of the material
- o Typed/printed name and title, and signature of authorized Supplier representative.

NOTE: When the mechanical properties of the material are altered, the material shall be re-certified and new documentation provided, or the original data

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over-stamped or annotated to reflect the altering process, date, traceability number, heat number, typed/printed name and title, and signature of authorized company representative, etc.

- 1.2 The only acceptable alternative to the mill certification, heat treat facility certification, etc., is certification from an independent testing laboratory, who is acceptable to the Government and Sperry, and who actually performed the tests. The certification shall consist of the quantitative data required in paragraph 1.1, taken from 100% item sampling.
- 1.3 The documentation provided to Sperry shall be the original or exact **reproducible** copies. **Transcription of data from other documentation is prohibited.**

CLAUSE 10 (B) RADIOGRAPHIC (RT) NDT, SUBSAFE LEVEL I OBJECTIVE QUALITY EVIDENCE (CASTINGS N/A)

INCLUDES RAW MATERIAL, FORGINGS, SPECIAL MATERIALS/PARTS

1. SPECIFIC REQUIREMENTS

- 1.1 The Supplier shall submit a copy of their applicable RT NDT procedure to the Sperry Quality department, via the applicable buyer, for review and written approval by Sperry and/or the customer. Submission shall be within thirty (30) days after receipt of the order, and approved **prior to shipment** of any material to Sperry.
- 1.2 Unless otherwise specified, the NDT procedure shall be in compliance with the requirements of NAVSEA Technical Publication T9074-AS-GIB-010/271, current revision (Supersedes MIL-STD-271, cancelled 27-May-1998).
- 1.3 Unless otherwise specified, personnel performing RT shall be certified in accordance with the requirements of NAVSEA Technical Publication T9074-AS-GIB-010/271, current revision (Supersedes MIL-STD-271, cancelled 27-May-1998). **A copy of the personal certification, including eye exam results, shall accompany each shipment of material.**
- 1.4 Unless otherwise specified, the **accept/reject criteria** shall be in accordance with the requirements of Mil-Std-2035, Nondestructive Testing Acceptance Criteria, current revision.
- 1.5 RT Shooting Sketch(s), Radiograph(s) (x-rays), RT data, interpretation sheets, etc., shall be provided to the Sperry Quality department **prior to shipment of any material**, for review/approval, via the cognizant buyer.

CLAUSE 10 (C) PENETRANT TESTING (PT) NDT, SUBSAFE LEVEL I OBJECTIVE QUALITY EVIDENCE (CASTING N/A)

INCLUDES RAW MATERIAL, FORGINGS, SPECIAL MATERIALS/PARTS

1. SPECIFIC REQUIREMENTS

- 1.1 The Supplier shall submit a copy of their applicable PT NDT procedure to the Sperry Quality department, via the applicable buyer, for review and

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written approval by Sperry and/or the customer. Submission shall be within thirty (30) days after receipt of the order, and approved **prior to shipment** of any material to Sperry.

- 1.2 Unless otherwise specified, the PT procedure shall be in compliance with the requirements of NAVSEA Technical Publication T9074-AS-GIB-010/271, current revision (Supersedes MIL-STD-271, cancelled 27-May-1998).
- 1.3 Unless otherwise specified, personnel performing PT shall be certified in accordance with the requirements of NAVSEA Technical Publication T9074-AS-GIB-010/271, current revision (Supersedes MIL-STD-271, cancelled 27-May-1998). **A copy of the personal certification shall accompany each shipment of material.**
- 1.4 Unless otherwise specified, the **accept/reject criteria** shall be in accordance with the requirements of Mil-Std-2035, Nondestructive Testing Acceptance Criteria, current revision.
- 1.5 PT data, test results, interpretation sheets, etc., shall be provided to the Sperry Quality department **prior to shipment of any material**, for review/approval, via the cognizant buyer.

CLAUSE 10 (D) ULTRASONIC TESTING (UT) NDT, SUBSAFE LEVEL I OBJECTIVE QUALITY EVIDENCE (CASTINGS N/A)

INCLUDES RAW MATERIAL, FORGINGS, SPECIAL MATERIALS/PARTS

1. SPECIFIC REQUIREMENTS

- 1.1 The Supplier shall submit a copy of their applicable UT NDT procedure to the Sperry Quality department, via the applicable buyer, for review and written approval by Sperry and/or the customer. Submission shall be within thirty days (30) after receipt of the order, and approved **prior to shipment** of any material to Sperry.
- 1.2 Unless otherwise specified, the UT procedure shall be in compliance with the requirements of NAVSEA Technical Publication T9074-AS-GIB-010/271, current revision (Supersedes MIL-STD-271, cancelled 27-May-1998).
- 1.3 Unless otherwise specified, personnel performing UT shall be certified in accordance with the requirements of NAVSEA Technical Publication T9074-AS-GIB-010/271, current revision (Supersedes MIL-STD-271, cancelled 27-May-1998). **A copy of the personal certification shall accompany each shipment of material.**
- 1.4 Unless otherwise specified, the **accept/reject criteria** shall be in accordance with the requirements of Mil-Std-2035, Nondestructive Testing Acceptance Criteria, current revision.
- 1.5 UT data, test results, interpretation sheets, etc., shall be provided to the Sperry Quality department **prior to shipment of any material**, for review/approval, via the cognizant buyer.

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CLAUSE 10 (E)

MATERIAL TRACEABILITY/INSPECTION REQUIREMENTS - SUBSAFE LEVEL 1
OBJECTIVE QUALITY EVIDENCE

INCLUDES RAW MATERIAL, FORGINGS, SPECIAL MATERIALS/PARTS AND
CASTINGS

1. The Supplier is required to maintain absolute traceability on all Subsafe Level I material and finished product supplied on this purchase order. The traceability extends from cradle-to-grave, beginning with the procurement of raw material and extending through machining, storage, special processes, sub-tier contract processing, etc., and subsequent shipment of the material to Sperry.
2. All Subsafe Level I raw material and finished product shall be permanently and legibly marked with the applicable unique traceability number (e.g., heat number, heat code, laboratory test report number, etc.). The unique number shall be used throughout the life of the material and shall appear on all pertinent documents.

- NOTE:
- o When the traceability number is machined/removed from raw material, the remaining portion of the material shall **immediately** be permanently and legibly identified with the traceability number.
 - o When the traceability number is removed and/or it is not practical to maintain the traceability number on the material (e.g., during the machining process), identification tags for each part with the traceability number and other pertinent data shall be attached and flow with the material through the applicable processes. The identification tag shall be apart from the individual part (only one (1) part at a time) only during the performance of an operation as required.
 - The material shall be re-marked/identified per applicable specifications as soon as possible.

3. All Subsafe Level I material shall be segregated to preclude commingling with other unauthorized material.
4. The Supplier shall inspect **all** characteristics (100%) of the completed Subsafe parts in accordance with the applicable drawings, specifications, etc., and record the actual measurements as applicable; features such as threaded diameters, etc., may be checked with Go/No-Go gages and designated "accept", or as applicable. All inspected parts shall be identified and traceable to the applicable inspection report, material certification, etc. via the unique traceability number, part number/revision, heat number, purchase order number, etc. A copy of the applicable Inspection Report shall be provided with each part shipped to Sperry, signed by the authorized company representative.

CLAUSE 10 (F)

MAGNETIC PARTICLE (MT) NDT, SUBSAFE LEVEL I OBJECTIVE QUALITY
EVIDENCE (CASTINGS N/A)

INCLUDES RAW MATERIAL, FORGINGS, SPECIAL MATERIALS/PARTS

1. SPECIFIC REQUIREMENTS

- 1.1 The Supplier shall submit a copy of their applicable MT NDT procedure to the Sperry Quality department, via the applicable buyer, for review and written approval by Sperry and/or the customer. Submission shall be within thirty (30) days after receipt of the order, and approved **prior to shipment** of any material to Sperry.
- 1.2 Unless otherwise specified, the NDT procedure shall be in compliance with the requirements of NAVSEA Technical Publication T9074-AS-GIB-010/271, current revision (Supersedes MIL-STD-271, cancelled 27-May-1998).
- 1.3 Unless otherwise specified, personnel performing NDT shall be certified in accordance with the requirements of NAVSEA Technical Publication T9074-AS-GIB-010/271, current revision (Supersedes MIL-STD-271, cancelled 27-May-1998). **A copy of the personal certification shall accompany each shipment of material.**
- 1.4 Unless otherwise specified, the **accept/reject criteria** shall be in accordance with the requirements of Mil-Std-2035, Nondestructive Testing Acceptance Criteria, current revision.
- 1.5 MT data, test results, interpretation sheets, etc., shall be provided to the Sperry Quality department **prior to shipment of any material**, for review/approval, via the cognizant buyer.

CLAUSE 11 MIL-PRF-19500 LOT TRACEABILITY

MANUFACTURER: During performance of this Sperry purchase order requirements, the Supplier Quality Control Inspection System and manufacturing processes are subject to review, verification and analysis by authorized Sperry and/or Government representatives. Traceability documentation in accordance with the requirement of MIL-PRF-19500 paragraph 3.7 (formerly MIL-S-19500 paragraph 3.3.1) is required with each lot quantity shipped on this purchase order.

DISTRIBUTOR: During performance of this Sperry purchase order requirement, the Supplier lot traceability documentation and inventory control for JAN branded devices is subject to review, validation and verification by an authorized Government representative. Traceability documentation in accordance with the requirement of MIL-PRF-19500 paragraph 3.7 (formerly MIL-S-19500 paragraph 3.3.1) is required with each lot quantity shipped on this purchase order.

CLAUSE 12 ELECTROSTATIC SENSITIVE DEVICES (ESD)

The Supplier facility shall have an ESD control program designed to protect components and assemblies that are sensitive to ESD damage during the manufacture, inspection, test, rework and/or failure analysis, packaging and shipment. The Supplier ESD program shall conform to MIL-STD-1686 Electrostatic Discharge Control Program . . . and MIL-HDBK-263 Electrostatic Discharge Control Handbook . . .

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Packaging must conform to industry standards for shipment of ESD sensitive devices. Reference ANSI/ESD S20.20-1999.

Components and assemblies sensitive to ESD damages shall be marked with MIL-STD-129 sensitive electronic device symbol and/or label.

Failure to comply with the handling and packaging requirements will result in rejection of the applicable items.

CLAUSE 13 **PACKAGING OF MULTI-LEAD COMPONENTS, ETC.**
BULK PACKAGING IS NOT ACCEPTABLE ON THIS PURCHASE ORDER.

Components supplied on this purchase order shall be packed in a manner to prevent damage, twisted/entangled leads, bent pins, etc.

CLAUSE 14 **QUALIFIED PRODUCTS - MIL-PRF-19500 DEVICES (formerly MIL-S-19500)**

All semiconductor devices furnished under MIL-PRF-19500 shall be QPL (**Qualified Products List**) listed. QPL-19500 revision currently in effect at the time of procurement is applicable. The devices shall be obtained directly from those manufacturers/authorized distributors listed, or approved for listing, therein.

Traceability documentation in accordance with the requirement of MIL-PRF-19500 paragraph 3.7 (formerly MIL-S-19500 paragraph 3.3.1) shall be provided with each lot quantity shipped on this purchase order.

CLAUSE 15 (A) **DESTRUCTIVE ANALYSIS SPECIMEN REQUIRED**

The Supplier shall provide a specimen of suitable size and configuration for destructive analysis with each shipment made against this Sperry Purchase Order. The specimen shall consist of a section of the same material and shall have been processed with the lot of material it represents through all special processes, (e.g., heat treatment, electroplating, paint finish, etc.).

CLAUSE 15 (B) **DESTRUCTIVE ANALYSIS TEST COUPON REQUIRED**

The Supplier shall submit a Test Coupon(s) with each shipment made against this Sperry purchase order. The Test Coupon(s), one (1) for each different piece of material used, shall consist of a ½" X 1" minimum section of the same material used to manufacture the lot of parts, and shall have been processed with the lot of material it represents through all special processes.

QC CLAUSE 16(var.)
INCLUDES NON-NUCLEAR SUBSAFE LEVEL I
MATERIAL/PROCESS CERTIFICATION

GENERAL REQUIREMENTS, FOR SUBSAFE LEVEL I MATERIAL

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Due to the critical application of Non-Nuclear Subsafe Level I material, documentation must be absolutely traceable to the material it represents and shall be maintained and provided to Sperry. It shall attest to the material identification and processes, providing maximum confidence in the integrity and quality of the material. All raw material and finished product shall be marked with the unique heat, lot, and/or traceability number(s) in accordance with purchase order, drawing and/or specification requirements. When the part is too small for marking, or the features of the part do not allow marking (e.g., 16 u/in finish), the parts shall be tagged for absolute identification.

CLAUSE 16(A) CASTING, LAYOUT REQUIREMENTS
(INCLUDES SUBSAFE LEVEL I)

The Supplier shall completely lay out one (1) casting to drawing/specification requirements and provide this casting with the initial shipment made on this Sperry purchase order. The casting shall be tagged or marked for ready identification.

CLAUSE 16(B) CASTING, SCRIBE-LINE REQUIREMENTS
(INCLUDES SUBSAFE LEVEL I)

The Supplier shall scribe legible starting lines in each of three (3) planes on each casting provided to Sperry on this purchase order.

CLAUSE 16(C) CASTING, CAVITY LAYOUT REQUIREMENTS
(INCLUDES SUBSAFE LEVEL I)

The Supplier shall supply a "laid-out" sample from each cavity in a multi-cavity mold and furnish a Certificate of Compliance (Sperry QC Clause 08 or 08b), stating that all samples conform to the drawing specifications.

CLAUSE 16(D) CASTING, FOUNDRY CONTROL/LAYOUT REQUIREMENTS
(INCLUDES SUBSAFE LEVEL I)

The Supplier shall completely lay out one (1) sample casting and submit it to Sperry for approval **prior to shipping** the remainder of castings on this Sperry purchase order. This casting, and subsequent castings, shall be produced under foundry control in accordance with the Sperry purchase order and applicable specification requirements. **Foundry control shall consist of** examination of castings by radiographic or other approved methods for determining internal/external discontinuities until the gating, pouring and other foundry practices have been established to consistently produce castings meeting the quality standards required by the material specifications and/or Sperry. This does not relieve the Supplier of the responsibility to meet the foundry control requirements imposed by the applicable material specification(s).

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When foundry control has been established, the **production method shall not be changed** without the Supplier demonstrating to the satisfaction of Sperry and/or purchaser that the change is inconsequential and does not adversely affect the quality of the casting.

Applicable quantitative material certifications and Non-Destructive Test (NDT) reports shall accompany the layout sample.

CLAUSE 16(E) **CASTING, NON-DESTRUCTIVE TESTING (NDT) PROCEDURE & TESTING APPROVAL**
(INCLUDES SUBSAFE LEVEL I)

Non-Destructive Testing (NDT) is required on the material to be supplied on this Sperry purchase order.

The Supplier shall submit a copy of their applicable NDT procedure to the Sperry Quality department via the applicable buyer, for review and written approval. Submission shall be within thirty days (30) after receipt of the order, and approved **prior to shipment** of any material to Sperry.

Unless otherwise specified, the NDT procedure shall be in compliance with the requirements of NAVSEA Technical Publication T9074-AS-GIB-010/271, current revision (Supersedes MIL-STD-271, cancelled 27-May-1998).

Unless otherwise specified, personnel performing NDT shall be certified in accordance with the requirements of NAVSEA Technical Publication T9074-AS-GIB-010/271, current revision (Supersedes MIL-STD-271, cancelled 27-May-1998). A **copy of the personal certification for the person performing the NDT must be on file at Sperry Marine.**

Unless otherwise specified, the accept/reject criteria shall be in accordance with the requirements of Mil-Std-2035, Nondestructive Testing Acceptance Criteria.

CLAUSE 16(F) **CASTING, SAMPLING INSPECTION REQUIREMENT**
(SUBSAFE LEVEL I N/A)

Unless otherwise specified, the Supplier shall inspect a minimum random sample quantity of castings per applicable specifications, selected in accordance with ANSI/ASQC Z1.4-1993, Level I / AQL 2.5, Sampling Procedures and Tables For Inspection By Attributes (Formerly used MIL-STD-105). The sample castings shall be tagged and/or marked for ready identification.

Any casting nonconformance shall be reported to the Sperry Quality department for evaluation and disposition, via the applicable buyer. The Supplier shall receive written approval **prior to any shipment** to Sperry.

CLAUSE 16(G) **CASTING, MATERIAL CERTIFICATE OF CONFORMANCE**
(SUBSAFE LEVEL I N/A)

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The Supplier shall provide a material Certificate of Conformance with each shipment on this purchase order. The certificate shall state that the material supplied conforms to the requirements of the Sperry purchase order and applicable specification requirements.

The certification shall contain adequate information for material lot identification (e.g., Sperry purchase order number, part number/revision, quantity supplied, unique lot identification number, serial numbers, type/grade/class/condition of the material, any other pertinent information required for material/lot identification).

Data supporting the certificate shall be on file either at the Supplier facility, or their sub-tier contractor, available to Sperry for review, and will be provided upon request.

CLAUSE 16 (H)

CASTING, QUANTITATIVE MATERIAL CERTIFICATION DATA
(SUBSAFE LEVEL I N/A)

1. Unless otherwise specified, First Article inspection is required.

First Article is defined as the first (1st) piece:

- a. from a new mold,
- b. or after repairs to a mold,
- c. or after changes to the mold.

2. The Supplier shall provide documentation with each shipment of material listing the quantitative results of tests required by Sperry purchase order and/or applicable specifications.

As a minimum, the results shall include:

- a. the quantitative results of chemical analysis,
- b. mechanical tests,
- c. dimensional checks,
- d. visual inspection.

3. The Supplier shall certify that the material and data conform to all applicable requirements. Certifications shall contain adequate information for material lot identification (e.g., Sperry purchase order number, part number/revision, quantity supplied, unique lot identification number, serial numbers, type/grade/class/condition of the material, any other pertinent information required for material/lot identification).

4. The lot quantity used for the first article shall be produced in conformance with applicable specifications achieved as a direct result of foundry control, and submitted to Sperry for evaluation.

On subsequent lots the Supplier must provide documented assurance that current foundry control/practice, related to the subject material, is identical to that used to qualify the material. In the event of minor changes, the Supplier shall state that any change is inconsequential and does not adversely affect the form, fit, function, or quality of the casting.

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Note: This does not relieve the Supplier of the responsibility to meet the First Article requirements outlined in material specifications, etc.

Failure to comply with requirements #1 through #4 will result in rejection of the material.

CLAUSE 16(I) CASTING, QUANTITATIVE CHEMICAL and MECHANICAL DATA,
(INCLUDES SUBSAFE LEVEL I MATERIAL)

1. SPECIFIC REQUIREMENTS

1.1 As a minimum, the following documentation shall be provided to the Sperry Quality department, via the applicable buyer, for review and written approval **prior to shipment** of any raw material or finished product. Unless otherwise specified, the documentation shall conform to the minimum data requirements of DI-MISC-81020 and all applicable specifications. Supplier certifications may vary from the sample certification format contained in DI-MISC-81020; however, the minimum data content is applicable.

- o Quantitative results of chemical analysis.
- o Quantitative results of mechanical tests.
- o Quantitative data and results of any material processes (e.g., heat treat, plating, etc.)
- o Statement of compliance on the certifications stating that the data/material conforms to specification requirements.
- o Other data pertinent to the identification, traceability and/or condition of the material.
- o Typed/printed name and title, and signature of authorized Supplier representative.

NOTE: When the mechanical properties of the material are altered, the material shall be re-certified and new documentation provided, or the original data over-stamped or annotated to reflect the altering process, date, traceability number, heat number, typed/printed name and title, and signature of authorized company representative, etc.

1.2 The only acceptable alternative to the mill certification, heat-treat facility certification, etc., is certification from an independent testing laboratory, who is acceptable to the Government and Sperry, and who actually performed the tests. The certification shall consist of the quantitative data required in paragraph 1.1, taken from 100% item sampling.

1.3 The documentation provided to Sperry shall be the original or exact **reproducible** copies. **Transcription of data from other documentation is prohibited.**

CLAUSE 16(J) CASTING, RADIOGRAPHIC (RT); NON-DESTRUCTIVE TESTING (NDT)
(INCLUDES SUBSAFE LEVEL I

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1. SPECIFIC REQUIREMENTS

- 1.1 The Supplier shall submit a copy of their applicable RT NDT procedure to the Sperry Quality department, via the applicable buyer, for review and written approval by Sperry and/or the customer. Submission shall be within thirty days (30) after receipt of the order, and approved **prior to shipment** of any material to Sperry. NOTE: This requirement is for the first order only and must be submitted for each unique part. After initial approval all subsequent changes to the procedure must be resubmitted for approval.
- 1.2 Unless otherwise specified, the RT procedure shall be in compliance with the requirements of NAVSEA Technical Publication T9074-AS-GIB-010/271, current revision (Supersedes MIL-STD-271, cancelled 27-May-1998).
- 1.3 Unless otherwise specified, personnel performing RT shall be certified in accordance with the requirements of NAVSEA Technical Publication T9074-AS-GIB-010/271, current revision (Supersedes MIL-STD-271, cancelled 27-May-1998). **A copy of the personal certification for the person performing the PT must be on file at Sperry Marine.**
- 1.4 Unless otherwise specified, the **accept/reject criteria** shall be in accordance with the requirements of Mil-Std-2035, Nondestructive Testing Acceptance Criteria, current revision.
- 1.5 RT data, Radiographs (x-rays), shooting sketch(s), interpretation sheets, etc., shall be provided with the material, to the Sperry Quality department for review/approval.

CLAUSE 16 (K) CASTING, PENETRANT TESTING (PT); NON-DESTRUCTIVE TESTING (NDT)
(INCLUDES SUBSAFE LEVEL I)

1. SPECIFIC REQUIREMENTS

- 1.1 The Supplier shall submit a copy of their applicable PT procedure to the Sperry Quality department, via the applicable buyer, for review and written approval by Sperry and/or the customer. Submission shall be within thirty (30) days after receipt of the order, and approved **prior to shipment** of any material to Sperry.
- 1.2 Unless otherwise specified, the PT procedure shall be in compliance with the requirements of NAVSEA Technical Publication T9074-AS-GIB-010/271, current revision (Supersedes MIL-STD-271, cancelled 27-May-1998).
- 1.3 Unless otherwise specified, personnel performing PT shall be certified in accordance with the requirements of NAVSEA Technical Publication T9074-AS-GIB-010/271, current revision (Supersedes MIL-STD-271, cancelled 27-May-1998). **A copy of the personal certification for the person performing the PT must be on file at Sperry Marine.**
- 1.4 Unless otherwise specified, the **accept/reject criteria** shall be in accordance with the requirements of Mil-Std-2035, Nondestructive Testing Acceptance Criteria, current revision.

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- 1.5 PT data, test results, interpretation sheets, etc., shall be provided with the material, to the Sperry Quality department for review/approval.

CLAUSE 16 (L) **CASTING, ULTRASONIC TESTING (UT), NON-DESTRUCTIVE TESTING (NDT)**
(INCLUDES SUBSAFE LEVEL I)

1. SPECIFIC REQUIREMENTS

- 1.1 The Supplier shall submit a copy of their applicable UT NDT procedure to the Sperry Quality department, via the applicable buyer, for review and written approval by Sperry and/or the customer. Submission shall be within thirty (30) days after receipt of the order, and approved **prior to shipment** of any material to Sperry.
- 1.2 Unless otherwise specified, the UT procedure shall be in compliance with the requirements of NAVSEA Technical Publication T9074-AS-GIB-010/271, current revision (Supersedes MIL-STD-271, cancelled 27-May-1998).
- 1.3 Unless otherwise specified, personnel performing UT shall be certified in accordance with the requirements of NAVSEA Technical Publication T9074-AS-GIB-010/271, current revision (Supersedes MIL-STD-271, cancelled 27-May-1998). **A copy of the personal certification for the person performing the UT NDT must be on file at Sperry Marine.**
- 1.4 Unless otherwise specified, the **accept/reject criteria** shall be in accordance with the requirements of Mil-Std-2035, Nondestructive Testing Acceptance Criteria, current revision.
- 1.5 UT data, test results, interpretation sheets, etc., shall be provided with the material, to the Sperry Quality department for review/approval.

CLAUSE 16 (M) **CASTING, VISUAL TESTING (VT), NON-DESTRUCTIVE TESTING (NDT)**
(INCLUDES SUBSAFE LEVEL I)

1. SPECIFIC REQUIREMENTS

- 1.1 The Supplier shall submit a copy of their applicable VT NDT procedure to the Sperry Quality department, via the applicable buyer, for review and written approval by Sperry and/or the customer. Submission shall be within thirty (30) days after receipt of the order, and approved **prior to shipment** of any material to Sperry.
- 1.2 Unless otherwise specified, the VT procedure shall be in compliance with the requirements of NAVSEA Technical Publication T9074-AS-GIB-010/271, current revision (Supersedes MIL-STD-271, cancelled 27-May-1998).
- 1.3 Unless otherwise specified, personnel performing VT shall be certified in accordance with the requirements of NAVSEA Technical Publication T9074-AS-GIB-010/271, current revision (Supersedes MIL-STD-271, cancelled 27-May-1998). **A copy of the personal certification for the person performing the VT must be on file at Sperry Marine.**

- 1.4 Unless otherwise specified, the **accept/reject criteria** shall be in accordance with the requirements of Mil-Std-2035, Nondestructive Testing Acceptance Criteria, current revision.
- 1.5 VT data, test results, interpretation sheets, etc., shall be provided with the material, to the Sperry Quality department for review/approval.

CLAUSE 16(N) CASTING, MAGNETIC PARTICLE (MT), NON-DESTRUCTIVE TESTING (NDT)
(INCLUDES SUBSAFE LEVEL I)

1. SPECIFIC REQUIREMENTS

- 1.1 The Supplier shall submit a copy of their applicable NDT procedure to the Sperry Quality department, via the applicable buyer, for review and written approval by Sperry and/or the customer. Submission shall be within thirty (30) days after receipt of the order, and approved **prior to shipment** of any material to Sperry.
- 1.2 Unless otherwise specified, the NDT procedure shall be in compliance with the requirements of NAVSEA Technical Publication T9074-AS-GIB-010/271, current revision (Supersedes MIL-STD-271, cancelled 27-May-1998).
- 1.3 Unless otherwise specified, personnel performing NDT shall be certified in accordance with the requirements of NAVSEA Technical Publication T9074-AS-GIB-010/271, current revision (Supersedes MIL-STD-271, cancelled 27-May-1998). **A copy of the personal certification for the person performing the NDT must be on file at Sperry Marine.**
- 1.4 Unless otherwise specified, the **accept/reject criteria** shall be in accordance with the requirements of Mil-Std-2035, Nondestructive Testing Acceptance Criteria, current revision.
- 1.5 MT data, test results, interpretation sheets, etc., shall be provided with the material, to the Sperry Quality department for review/approval.

CLAUSE 17 TEST ACCEPTANCE PROCEDURES APPROVAL

The Supplier shall submit two (2) copies of their proposed Acceptance Inspection/Test Procedure to the Sperry Quality Department for review and written approval (or disposition). Submittal must be made, prior to the first shipment, or after any revision, and within thirty (30) days of receipt of a purchase order.

The procedure format shall include the parameters to be measured, step-by-step method of test, test equipment required, and provisions for recording the data in a clear and concise manner. If the Supplier procedures reference specific test fixtures for final test acceptance, a copy of the schematic of these fixtures shall be supplied to Sperry.

CLAUSE 18 NO CHANGES WITHOUT SPERRY APPROVAL

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The Supplier shall certify that since completion of the previous Sperry purchase order for this material, the Supplier design, construction and components have not been changed. Documented certification shall be supplied with this Sperry purchase order shipment.

CLAUSE 19 MERCURY AND OTHER PROHIBITED METALS EXCLUSION CERTIFICATE -

The supplier shall certify the absence of certain prohibited compounds in this shipment of material as required in Paragraph A, or, in the alternative, shall disclose the presence of the compounds in the manner prescribed in Paragraph B.

A) The Supplier shall provide a certificate with each lot of material confirming that the material being supplied to Sperry contains neither metallic mercury, cadmium, hexavalent chromium nor any compounds of these elements. The Supplier shall further state that they have taken all reasonable steps to insure that the material has not been contaminated with these elements or their compounds. This document shall include the applicable Sperry purchase order number, part number and revision, part description, quantity of material, unique traceability number, and other pertinent information required for item or lot identification.

B) If material supplied to Sperry contains one of the restricted elements mentioned above, or has been exposed to them at any stage of the manufacturing process, the supplier shall provide a certificate with each lot of material identifying the element, the amount thereof and measures taken to mitigate its effects, such as containment, encapsulation, etc. This document shall include the applicable Sperry purchase order number, part number and revision, part description, quantity of material, unique traceability number, and other pertinent information required for item or lot identification. The appropriate Material Safety Data Sheet (MSDS) shall accompany this certificate.

CLAUSE 20 FIRST ARTICLE CONFIGURATION INSPECTION/TEST (FACI)

Sperry First Article Configuration Inspection (FACI) is required on this material **prior to shipment** from the Supplier facility. Notify the applicable Sperry buyer five (5) working days in advance of the actual date the material will be ready for Sperry evaluation at the Supplier facility. This inspection will include review of the item or assembly, including its component parts and associated software to verify conformance to applicable specification requirements (e.g., purchase order, drawing, test procedure, operation sheets, etc.).

CLAUSE 21 MATERIAL AND PROCESS CONTROL, RECORD RETENTION

Material and services supplied to Sperry shall conform to all purchase order requirements. The Supplier and sub-tier contractors shall retain supporting documentation used to qualify the material or service for a minimum of four years. This may include, but is not limited to, material certifications, process certifications, samples or inspection results. Such documentation shall be available to Sperry for review and will be provided to Sperry upon request.

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CLAUSE 22 MIL-HDBK-454, GENERAL GUIDELINES FOR ELECTRONIC EQUIPMENT

(Deleted)

CLAUSE 23 QUALITY AND WORKMANSHIP STANDARDS TO BEST COMMERCIAL PRACTICES

The material being provided by the Supplier shall be built in accordance with Best Commercial Practices. Best Commercial Practice is defined as those standards/practices normally used and accepted by the industry that will ensure an acceptable level of quality, reliability and integrity (e.g., IPC-, ANSI-, ASTM-, etc., specifications).

CLAUSE 24 EQUIPMENT/MATERIALS PACKAGING-PRESERVATION

Unless otherwise specified (by purchase order, drawing, etc.), the Supplier shall take reasonable precautions to determine that all material is protected against corrosion, contamination, deterioration, damage and/or other elements that may adversely affect the quality and/or application of the material. The material shall be packaged adequately to protect it throughout manufacturing, handling, transit, storage, and end use.

Examples:

1. Carbon steel should be coated with rust preventive
2. Small multiple lead components should not be bulk packaged
3. Precision diameters, threads should be protected from damage during shipping/handling
4. Solderable components should be packaged to prevent environmental contamination during handling and/or storage
5. Etc.

CLAUSE 25 SUNDRY/HAZARDOUS, LIMITED LIFE MATERIAL

As applicable, the following information shall be provided with each shipment of material on this purchase order, including adhesives, paints, chemicals and rubber goods used in the manufacture of the material:

Clause 25 (A) Date of Manufacture/cure date required (DOM). (Effective 5/1/2005 now Clause 25(A))

Clause 25 (B) Date of shelf-life Expiration required (DOE). (Effective 5/1/2005 now Clause 25(B))

Clause 25 (C) Material Safety Data Sheet required (MSDS) for hazardous material (Effective 5/1/2005 now Clause 25(C))

1. Containers of materials/items having characteristics susceptible to quality degradation with age must be marked with DOM and DOE identifying the useful life of the material. When space is not available for such marking or in

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lieu of container marking, documentation shall be supplied stating the applicable DOM and DOE, traceable by lot or batch number applied to the container. When practical, rubber items shall be permanently and legibly marked with DOM (or date of assembly if installed); otherwise, the DOM and DOE shall be marked on the container/package or supplemental documentation.

2. Material will not be accepted if more than 25% of the established useful life has expired. Documented evidence of revalidation by the manufacturer, containing the revalidation date of expired material and adjusted DOE, will be acceptable provided the above criteria are met.
3. Hazardous material includes items such as paint, epoxy, adhesives, cleaners, etc.

Clause 25 (D) Perishable (age sensitive) seals and o-rings shall be individually packaged, marked, and stored as prescribed by the current revision of SAE AMS2817. Any one of the three packaging materials identified in Section 3.2 is acceptable. Shipment of material certifies that it has, at all times, been stored and protected in a manner consistent with the provisions of the standard.

CLAUSE 26 (A) FIRST-PIECE INSPECTION REPORT, BY SUPPLIER

The Supplier shall perform a complete first-piece inspection (100% characteristics) on a minimum of one (1) piece for each lot and line item shipped on this Sperry purchase order, and provide a quantitative Inspection/Test Report for the part(s) it represents verifying conformance to applicable specifications.

CLAUSE 26 (B) FIRST-PIECE INSPECTION APPROVAL PRIOR TO SHIPMENT

Use QC Clause 49

CLAUSE 27 PIECE-MARKING REQUIREMENTS

Unless otherwise specified, the complete Sperry item number (Code Identification, Item Number, Revision) shall be applied to the material/part in accordance with MIL-STD-130. The marking shall be legible, permanent and located in a position to be easily seen without interfering with mating surface functions.

If the item is too small for marking, or if it is not practical to apply the information to the part, it shall be packaged and the package identified as stated above.

CLAUSE 28 WIRE, MIL-W-81822 REQUIREMENTS (Solderless Wrap)

The length of wire between splices, spark test failures, wire ends, etc. supplied on any spool, reel, drum, etc., on this Sperry purchase order shall be one hundred feet (100') minimum. The Supplier shall identify each spool, etc. with the Sperry purchase order number, Sperry "material code number", applicable specification number, etc.

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CLAUSE 29 BEARINGS - IDENTIFICATION, SHELF LIFE, PACKING

1. Bearings shall be "unit-packed" and each package legibly marked to identify the Sperry item number, date of manufacture (DOM), lubrication shelf-life expiration date (DOE) and type/part number.
2. Any conflict between the current Supplier item number/type and that specified on the Sperry drawing must have a Supplier cross reference document supplied with the applicable lot of bearings being shipped to Sperry.
3. Bearings supplied to Sperry shall have a minimum of eighty percent (80%) useful shelf life remaining

CLAUSE 30 (A) MACHINING QUALITY REPORTING, (DIMENSIONAL DATA)

The Supplier shall provide a quantitative Inspection Report listing the dimensional data, applicable tolerance, drawing zone and actual measurements for each item delivered to Sperry. Each report shall be serial number identified, traceable to the part it represents. The Inspection Report shall be legible and clearly marked to identify conformance, or nonconformance, to applicable specifications.

CLAUSE 30 (B) MACHINING QUALITY REPORTING, (NONCONFORMING MATERIAL)

The Supplier shall report any nonconformance to the Sperry Quality department via the applicable buyer for review and disposition. The Supplier shall receive written approval **prior to shipment** of any nonconforming material. The Supplier shall identify the material with the nonconformance approval document number (jeweler's tag, container marking, etc.) and include a copy of the approval document in the shipment to Sperry.

CLAUSE 30 (C) MACHINING QUALITY REPORTING, (MATERIAL CERTIFICATION)

USE QC CLAUSE 08, 21

CLAUSE 30 (D) BRAZING/WELDING QUALITY REPORTING (PT/RT)

The Supplier shall perform Penetrant Testing (PT) or Radiographic Inspection (RT) of brazing or weldments per applicable specifications, and provide applicable test reports and all radiographs to Sperry with shipments.

CLAUSE 30 (E) PROCESS QUALITY REPORTING

By accepting this Sperry purchase order, the Supplier certifies the processes to be used in the manufacture of this material conform to the requirements of applicable drawings, specifications and any special requirements of the purchase order.

CLAUSE 31 BERYLLIUM PACKAGING

Beryllium material parts shall be individually packaged in sealed polyethylene bags with the appropriate type desiccant and humidity indicator inside of the bag. Desiccant pouches are not to be in contact with the part; double bagging is a recommended method (part wrapped in an unsealed bag; the wrapped part and the desiccant sealed inside an outer bag). When plastic capsule desiccants are used, double bagging is not required. The sealed bags are to be individually packed, in plastic containers with covers for shipment.

CLAUSE 32 FIVE POWER (5X) INSPECTION, SPECIAL MECHANICAL PARTS

Five power magnification (5X) inspection is required on material supplied on this purchase order. The material/parts shall be free of burrs, sharp or "ragged" edges, slivers, contaminants, etc.

CLAUSE 33 ADHESIVE USAGE, MIL-HDBK-454 REQUIREMENT

USE CLAUSE 22

CLAUSE 34 SPERRY SPECIFICATIONS INVOKED

DELETED

CLAUSE 35 PRINTED WIRING BOARD (PWB) DESTRUCTIVE ANALYSIS SAMPLE REQUIRED

With any Sperry purchase order for lot quantity \geq fifty (50) PWBs, one (1) sample production board per each twenty-five (25) PWBs shall be supplied for Sperry Quality destructive analysis testing. When a lot quantity $<$ fifty (50) pieces is shipped, one (1) sample production board must be supplied for quality testing purposes.

CLAUSE 36 SPERRY ACCESS FOR FACILITY AUDIT AND SURVEILLANCE

During the manufacture of material on this Sperry purchase order, the Supplier's Quality System, inspection system and manufacturing processes are subject to review and surveillance by authorized representatives from Sperry and/or our Customers.

CLAUSE 37 CALIBRATION OF INSPECTION, MEASUREMENT, AND TEST EQUIPMENT (IMTE)

The Supplier shall maintain a documented calibration system in accordance with

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the requirements of this clause. Equipment used to inspect, test or qualify material and components supplied to Sperry shall be calibrated in accordance with a calibration system that meets the requirements of ISO 10012-1 (Part 1), ANSI/NCSL Z540-1, ISO/IEC 17025, MIL-STD-45662A or other internationally recognized system, and equipment accuracy shall be traceable to the National Institute of Standards and Technology (NIST). Supporting documentation shall be maintained to verify that, at the time of use on material to be supplied to Sperry, such equipment conformed to the requirements of this clause and all applicable specifications.

CLAUSE 38 (A) SERIALIZATION REQUIRED

Serialization, in accordance with applicable specifications or specific instructions from Sperry, shall be applied to material/parts supplied on this purchase order. The absence of serialization will be cause for rejection of the material.

CLAUSE 38 (B) SERIALIZATION REQUESTED

The supplier is requested to identify each item of material with a unique serial number. When serialization on the part is not practical because of size or shape, the serial number may be placed on the individual part package. The absence of serialization will not be cause for rejection of the material.

CLAUSE 39 SPECIAL PROCESS PERSONNEL CERTIFICATION, MILITARY

The Supplier personnel performing **soldering, wire-wrap and fusion welding** on Sperry material for this purchase order require certification per applicable military specifications. A copy of the applicable certification(s) shall be provided with each shipment of material.

CLAUSE 40 GOVERNMENT FURNISHED EQUIPMENT (GFE) / GOVERNMENT FURNISHED MATERIAL (GFM)

The Supplier must maintain a program for the positive identification, segregation and control of any GFE/GFM. The Supplier's program shall provide for notice to the applicable Government Inspection Agency and the Sperry Quality Department, thru the relevant Sperry Buyer, of any deficiency or failure noted when GFE/GFM is received.

CLAUSE 41 SUPPLIER PROCUREMENT (FLOW-DOWN), MATERIAL AND SERVICES

The Supplier shall maintain a system to insure that Supplier procured material, supplies and services conform to the applicable Sperry drawings, specifications, and purchase order requirements. Both the Supplier and sub-tier contractors shall maintain objective quality evidence verifying conformance to these requirements.

All relevant quality requirements and specifications shall be communicated, or flowed down, to each sub-tier supplier. The satisfaction of these quality requirements and specifications is subject to Sperry review and approval, as are the Supplier's flow-down processes.

CLAUSE 42 **FORMIC ACID CERTIFICATION**

The Supplier (including sub-tier contractors) shall provide a certificate with each lot of material supplied on this purchase order specifically stating that the subject material does not contain Formic acid, and that Formic acid has not been used in any handling and manufacturing processes. The certificate shall be signed by an authorized Supplier Quality representative, The documentation shall reference the Sperry purchase order number, part number, serial/lot number(s), heat number, lot quantity, etc., or other information required for lot identification.

CLAUSE 43 **EU RoHS COMPLIANCE**

The Restriction of the Use of Certain Hazardous Substances (RoHS) Directive, 2002/95/EC of February 13, 2003, was enacted by the European Community to minimize the impact of end-of-life electrical and electronic equipment on the environment. The Directive bans the use of lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB), and polybrominated diphenyl ethers (PBDE) in certain electrical and electronic products sold in the European Union beginning July 1, 2006.

Seller shall provide a certificate of compliance to the RoHS Directive, 2002/95/EC for the items supplied under this Purchase Order and provide information as needed to confirm process compatibility and traceability. Compliant parts must be uniquely identifiable. The identification scheme employed must clearly differentiate compliant parts from their predecessors. In lieu of specific reporting requirements, Seller will provide material declarations based on the latest version of the IPC-1752 standard. This statement must also include, as a minimum, purchase order number, part identification, revision, serial, lot or batch number (if applicable), and quantity.

Should any material not comply, the seller shall provide to the NG buyer a chemical test report showing the concentration of the banned substance. Should there be an allowable exemption for any material, the seller shall also contact the NG buyer with this information and supporting documentation. At the discretion of NG, the material may be rejected and returned to the seller if the concentration of the hazardous substance is over the established limits. NG also reserves the right to request a written plan from the seller detailing the necessary steps required to bring the material into compliance and the date when compliance will be established.

CLAUSE 44 **REQUIREMENT FOR TIN AND TIN ALLOY PLATINGS AND SOLDERS**

Unless a Lead (Pb)-free material is specified in the applicable Sperry drawing or explicitly specified by Sperry in writing, only Tin-Lead (Sn/Pb) solder with

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3% or greater lead content by weight is allowed on:

- Ball Grid Array (BGA)
- Column Grid Array (CGA)
- Fine Pitch (FP) Components (with 20 mil or less lead pitch termination or 10 mil or less pad spacing)

If requested, the supplier shall submit the material manufacturer's certification or other evidence of lead content for review by Sperry. This does not relieve the supplier of the responsibility to test, evaluate, and gather data supporting claims of their compliance to this requirement. Inability to comply shall be immediately reported to the responsible Sperry Buyer and product shipment shall be withheld pending direction from the Buyer.

CLAUSE 45 **TAPE AND REEL PACKAGING REQUIRED**

1. Axial lead components - Tape & Reel/Package per ANSI/EIA-296 requirements.
2. Surface Mount Components - Tape & Reel/Package per 03956-EB1898251 requirements.

NOTE: ORDER QUANTITIES LESS THEN THE MINIMUM ORDER FOR TAPE AND REEL ARE ACCEPTABLE BUT MUST MEET CLAUSE 13 REQUIREMENTS

CLAUSE 13 MAY BE SUBSTITUTED IF ORDER QUANTITIES ARE LESS THEN THE MINIMUM ORDER FOR TAPE AND REEL.

Note: Bulk packaging of components is acceptable in quantities of 1000 or less when tape and reel is impractical.

CLAUSE 46 **RUST PREVENTATIVE PACKAGING IS REQUIRED ON THIS LOT**

USE QC CLAUSE 24

CLAUSE 47 **HEAT TREATMENT TEST REPORT IS REQUIRED, IN ACCORDANCE WITH THE APPLICABLE SPECIFICATION**

CLAUSE 48 **MATERIAL TRACEABILITY AND AUTHENTICITY**

The Supplier shall establish and maintain a suitable system for providing traceability of materials and processes used during the performance of the Sperry purchase order requirements. This requisite shall also be flowed down to and imposed on all sub-tier contractors. Traceability records must be kept on file for a period of **four (4) years** following completion of this Sperry purchase order and are subject to review or audit by Sperry. In the alternative, the traceability documents may be delivered with the material to Sperry for review and retention."

Electronic devices, manufactured electronic assemblies, micro circuitry and material in critical applications supplied by an independent broker or any distributor other than an approved distributor of the original equipment

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manufacturer (OEM) must be traceable to the OEM by documented evidence. This documentary evidence of traceability shall be retained by the Supplier for a period of four years following the completion of this Sperry purchase order and is subject to review or audit by Sperry. In the alternative, the traceability documents may be delivered with the material to Sperry for review and maintenance.

CLAUSE 49 FIRST-PIECE INSPECTION AT SPERRY

The Supplier shall provide **one (1) piece only** to Sperry for evaluation and approval (or disposition). The Supplier **shall not ship additional material** until written approval is received.

Sperry Receiving Inspection and/or supporting functions shall perform inspection/test on 100% of the characteristics, or as much as is practical, and advise the Supplier (via the applicable Sperry buyer), in writing, of the disposition of the material.

CLAUSE 50 CLEANLINESS, PRINTED WIRING BOARD (PWB) ASSEMBLIES - ANSI/J-STD-001

(MIL-C-28809, former cleanliness requirement specification, was canceled April 21, 1995, without replacement)

The PWBs shall be cleaned adequately to remove any visual evidence of residues or contaminants. As a minimum, the PWBs shall conform to the cleanliness requirements of ANSI/J-STD-001, C-22 cleanliness designator (Para. 8.3.2).

The Supplier shall provide a certification (or test data) verifying that the completed PWB assembly (less conformal coating) conforms to the cleanliness requirement. The data shall be identified with the Sperry purchase order number, part number/revision, lot quantity, serial numbers, etc.

CLAUSE 51 SPECIAL QUALITY REQUIREMENTS

(Deleted)

CLAUSE 52 MIL-M-38510 MICROCIRCUIT REQUIREMENTS APPLY TO THIS ORDER

NOTE: On 27-Aug-93, MIL-M-38510 became **inactive for new designs**. MIL-M-38510 is to be used only for replacement purposes. Use the **supersession/inactive data below** as outlined in MIL-M-38510 Rev. J, Notice 1, 27-Aug-93:

MIL-M-38510 Section

Replacement Information

Main Body
Appendix A - QA Program Plan
Appendix B - Statistical Sampling

MIL-I-38535 Appendix A
MIL-I-38535 Appendix C

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Appendix C - Case Outline	MIL-STD-1835
Appendix D - Material/Test Data . . . QPL	No Replacement
Appendix E - Microcircuit Group Assignments	MIL-I-38535 Appendix A 40.5.4.1.1
Appendix F - Preparation of Device Specifications	MIL-HDBK-780
Appendix G - Gen. Req. For Hybrids	MIL-M-38534
Appendix H - PIN Substitution	MIL-STD-983
Appendix I - JAN Source	MIL-I-38535 Appendix A 30.1.3.36

CLAUSE 53 **PRINTED CIRCUIT BOARDS: ANSI/J-STD-001, CLASS 2, REQUIREMENTS**
(Dedicated Service Electronic Products)

Unless otherwise specified, printed circuit boards/assemblies manufactured for the Sperry purchase order shall be in full compliance with ANSI/J-STD-001, Class 2, requirements.

CLAUSE 54 **PRINTED CIRCUIT BOARDS: ANSI/J-STD-001, CLASS 3, or IPC 610 Class 3**
Requirements (High Performance Electronic Products)

Unless otherwise specified, printed circuit boards/assemblies manufactured for the Sperry purchase order shall be in full compliance with ANSI/J-STD-001, Class 3, or IPC 610, Class 3, requirements.

CLAUSE 55 **CHINA RoHS COMPLIANCE**

CHINA RoHS COMPLIANCE - People's Republic of China Electronic Industry Standard, SJ/T11364-2006, Marking for Control of Pollution Caused by Electronic Information Products, was enacted by the China to minimize the impact of end-of-life electrical and electronic equipment on the environment. This standard bans the use of lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB), and polybrominated diphenyl ethers (PBDE) on certain electrical and electronic products sold in China. The implementation is based on a phased approach beginning with equipment shipped 1 March 07, the first phase being a declaration phase and the second being a compliance phase. Unless specified otherwise in the purchase order, or identified specifically below, the implementation level shall be to Phase Two.

Seller shall provide certification status of CHINA RoHS compliance for the items supplied under this Purchase Order and provide information as needed to confirm process compatibility and traceability. Compliant parts must be uniquely identifiable. The identification scheme employed must clearly differentiate compliant parts from their predecessors. In lieu of specific reporting requirements, Seller will provide material declarations based on the latest version of the IPC-1752 standard. This statement must also include, as a minimum, purchase order number, part identification, revision, serial, lot or batch number (if applicable), and quantity.

Should any material not comply, the seller shall provide to the NG buyer a chemical test report showing the concentration of the banned substance. Should there be an allowable exemption for any material, the seller shall also contact the NG buyer with this information and supporting documentation. At the

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discretion of NG, the material may be rejected and returned to the seller if the concentration of the hazardous substance is over the established limits. NG also reserves the right to request a written plan from the seller detailing the necessary steps required to bring the material into compliance and the date when compliance will be established.

CLAUSE 56 HEXAVALENT CHROMIUM EXCLUSION

Hexavalent chromium shall not be used in the manufacture of this item unless specifically authorized by Sperry Marine. The supplier shall ship with the material either a written certification, bearing the signature and title of a person authorized to certify compliance, that no hexavalent chromium has been used in the manufacturing process or a copy of the Sperry document authorizing its use.

When a chemical film is required, the Supplier shall use only a trivalent chromium finish which conforms to the requirements of MIL-DTL-81706B and is in compliance with MIL-DTL-5541, Type II chemical film, unless the Sperry Marine drawing specifies a MIL-DTL-5541, Type I chemical film or if the use of a Type I chemical film has been authorized in writing. This requirement shall be flowed down to all relevant sub-tier suppliers.

CLAUSE 57 THROUGH 59 (LEFT BLANK ON PURPOSE)

CLAUSE 60 PAINT, PRIMER, COATINGS & CHEMICAL CONVERSION

Paint and Coating Certification - This material shall be surface treated, primed, painted or coated in strict accordance with the specifications contained in the drawing and purchase order, and all specifications incorporated by reference therein. A Certification of Compliance bearing the signature and title of a person authorized to certify compliance shall be submitted with the material by the supplier. Data, including samples or specimens, used to support the certification shall be maintained and made available on request.

For each lot of material shipped, a specimen plate shall be submitted with the lot. The plate shall be of the same base material as was used to produce the lot, shall be not less than 10" x 8" in length and width and shall consist of equal parts of bare metal, corrosion treated metal, primed or coated metal and finish painted metal, as relevant. The specimen plate shall be produced using the same shop processes as are used to produce the material supplied under the purchase order and by masking the plate appropriately at the conclusion of each process step. The specimen plate shall be a fair representation of the quality and condition of the finished material.

CLAUSE 61 WELDING/WELDER CERTIFICATION- T9074-AS-GIB-010/278 & T9074-AQ-GIB-010/248

Unless otherwise specified, Welding in accordance with T9074-AS-GIB-010/278 (formerly MIL-STD-278) / T9074-AQ-GIB-010/248 (formerly MIL-STD-248) is required

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on this purchase order. As a minimum, the Supplier shall provide the following data and/or certifications, in accordance with purchase order requirements, drawing requirements, and these specification requirements, to Sperry:

- The welding **procedure**(s) shall be submitted to the Sperry Quality department via the applicable buyer for evaluation within thirty (30) days of the receipt of this purchase order, but **prior to shipment** of any welded/weld repaired material to Sperry.
- The weld report and Nondestructive Test (NDT) results shall be submitted to the Sperry Quality department via the applicable buyer for evaluation **prior to shipment** of any welded/weld repaired material to Sperry.
- The personal certification(s) for personnel performing welding and NDT shall be submitted to the Sperry Quality department via the applicable buyer for evaluation **prior to shipment** of any welded/weld repaired material to Sperry.
- Unless otherwise specified, NDT procedures and personnel shall be certified in accordance with the requirements of NAVSEA Technical Publication T9074-AS-GIB-010/271, current revision (Supersedes MIL-STD-271, cancelled 27-May-1998). **A copy of personnel certifications shall accompany each shipment of material.**

NOTE: This Quality requirement is applicable to all levels of sub-tier contractors; all documentation must be submitted to the Sperry Quality department via the applicable buyer for review and approval (or disposition) **prior to shipment** of any welded/weld repaired material to Sperry.

CLAUSE 62 BRAZING / BRAZER CERTIFICATION

The Supplier brazer(s) shall be qualified in accordance with the requirements of T9074-AQ-GIB-010/248 (formerly MIL-STD-248). All applicable brazing procedures and brazer certifications shall be submitted to the Sperry Quality department via the cognizant buyer for review and approval (or disposition) within thirty (30) days of receipt of this purchase order. Approval shall be provided **prior to the performance of any brazing operation or subsequent shipment** of any material to Sperry.

CLAUSE 63 NAVSEA-0900-LP-001-000 WELDING, BRAZING CERTIFICATION

The Supplier welder(s)/brazer(s) must be qualified in accordance with the requirements of NAVSEA-0900-LP-001-000 specification. All applicable welding/brazing procedures and welder/brazer certifications must be submitted to the Sperry Quality department via the cognizant buyer for review and approval (or disposition) within thirty (30) days of receipt of this purchase order. Approval shall be provided **prior to the performance of any welding/brazing or subsequent shipment** to Sperry.

CLAUSE 64 WELDING, BRAZING CERTIFICATION, SPECIAL REQUIREMENTS

The Supplier Welders and/or Brazers are required to be qualified in accordance

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with the special requirements invoked on this Sperry purchase order.

CLAUSE 65 FIRST-PIECE (FIRST ARTICLE) INSPECTION AND REPORT REQUIRED

For the first deliverable piece from each production lot, each feature affecting form, fit or function shall be inspected/measured and the results documented in a written report. A copy of the report, bearing the inspector's signature and title, shall accompany each shipment of material from that production lot.

CLAUSE 66 SUPPLIER DRAWING, CATALOG, SPECIFICATION SHEET, ETC., REQUIRED

The Supplier of this material shall provide a current and legible copy of the manufacturer's drawing, catalogue sheet or specification sheet with the material. This documentation must be adequate to permit the certain identification of the material by appearance, characteristics and manufacturer's part number. Failure to provide this information may necessitate the rejection of the material.

CLAUSE 67 PRINTED CIRCUIT BOARDS; MIL-PRF-31032 SPECIFICATION REQUIREMENTS (MIL-P-55110 previous specification cancelled)

Reference QC Clauses #53 & #54

CLAUSE 68 SOLDERING CERTIFICATIONS, MIL-STD-2000A (MIL-STD-2000A was canceled 07-June-95 without replacement)

Reference QC Clauses #53 & #54

CLAUSE 69 SOFTWARE DEVELOPMENT/QUALITY - MIL-STD-498 (Interim)

NOTE: MIL-S-52779, Software Quality Assurance Program Requirements was canceled 29-June-90;

Subsequent replacement, DOD-STD-2168, Defense System Software Quality Program was canceled without replacement 20-Mar-95.

CLAUSE 70 GIDEP (GOVERNMENT-INDUSTRY DATA EXCHANGE PROGRAM)

MIL-STD-1556B, Notice 1, 30-Sep-1996 cancelled the specification. Guidance for GIDEP is contained in the Defense Acquisition Deskbook under "Information Structure" at Section 2.6A, "GIDEP Operations Manual published by the GIDEP Operations Center, and MIL-HDBK-965.

The Supplier shall provide and maintain a system for participation in the Government Industry Data Exchange Program (GIDEP) in accordance with MIL-STD-1556. The Supplier shall notify the applicable Sperry buyer of any GIDEP Alert that affects the material on this purchase order and shall keep the applicable buyer fully informed through the final disposition/closure of the GIDEP Alert.

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CLAUSE 71 SUPPLIER MATERIAL REVIEW AUTHORITY, N/A

The Supplier, including sub-tier contractors, shall not exercise Material Review Authority on any material without written consent from the Sperry Quality Department Manager, applicable to a specific purchase order. Nonconformances shall be reported to the Sperry Quality Department for review and disposition **prior to any shipment of material.**

QR QUALITY REVIEW

DELETED, with Implementation of Baan