Technical Ordering Data

Shackles

1. **A Signed Certificate of Compliance is required which validates and states the Shackles meet items 1.1 thru 1.4**: (See Contract Data Requirements List (DI-MISC-81356) Certificate of Compliance)

   1.1. **Material** – Shackles are forged of alloy or carbon steel and meet the technical requirements of the current revision of Federal Specification RR-C-271 (Grade A or B), paragraph 3.1.1, Table 1 for material composition.

   1.2. **Surface Treatment** – Shackles have NO surface treatments such as paint, galvanization, or other coatings. No RFID device or equivalent installed.

   1.3. **Minimum Factor of Safety** – Shackles have a minimum breaking strength that is 5 times the manufacturer's rated safe working load.

   1.4. **Marking -** The manufacturer identification and safe working load is clearly marked on each shackle.

2. **A Data Report is required which provides the information in items 2.1 and 2.2 below:**

   2.1. **Defect Removal** - The manufacturer shall provide authorization for defect removal by grinding, provided that such reduction anywhere on the shackle or pin does not reduce the cross-sectional diameter of the bow to less than 90% or the cross-sectional diameter of the pin diameter to less than 95% of the corresponding dimensions (D or P) shown in Federal Specification RR-C-271. Grinding shall longitudinally follow the contour of the shackle or pin and be contoured with a 3:1 taper. (See Contract Data Requirements List (DI-MISC-80678) Defect Removal Authorization)

   2.2. **Periodic Load Testing** –The manufacturer shall either 1) provide authorization to periodic load test between 150% and 155% of the manufacturer's rated capacity/working load limit or 2) provide recommended maximum periodic test load. (See Contract Data Requirements List (DI-MISC-80678) Period Load Test)

3. **Signed Certificates of Test and Inspections for each Shackle (identified by unique serial number) to document the following:**

   3.1. **Proof Static Load Test** (See Contract Data Requirements List (DI-NDTI-80809) Static Load Test) - The shackle shall be proof tested for a minimum of ten minutes at 200% to 205% of the manufacturer's safe working load based on certified weights or as indicated on a load indicating device. The manufacturer must provide a Certificate which identifies each shackle by a serial number and verifies a proof load test was completed as directed for each shackle.

   3.2. **Visual Inspection** (See Contract Data Requirements List (DI-NDTI-80809) Visual Inspection) – Following the proof load test, the manufacturer shall visually inspect the shackle for damage such as nicks, gouges, cracks or other defects that could reduce the load bearing capacity.

   3.3. **Magnetic Particle (MT) Inspected** - (See Contract Data Requirements List (DI-NDTI-80809) Magnetic Particle Test) After proof testing, the accessible areas of the shackle shall be 100% MT Inspected per NAVSEA Technical Publication T9074-AS-GIB-010/271, (TP-271), requirements for Non-Destructive Testing Methods. Acceptance criteria shall be per MIL-STD-2035A. MT inspections performed in accordance with ASTM A275, Standard Test Method for Magnetic Particle Examination of Steel Forgings, are acceptable provided the TP-271 requirements are met for:

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Technical Ordering Data

Shackles

a) Arc Strikes – Arc strikes shall be ground out, faired into surrounding material, and re-inspected using the prod or yoke method or visually inspected at not less than 5X magnification. Excavations and remaining wall thickness shall be inspected for and shall meet the requirements of the governing specification.

b) Tolerance on Equipment Ammeters – To check the equipment ammeter, a suitable calibrated ammeter shall be connected in series with suitable shunts and the current through the electrodes measured. The amperage measured by the calibrated ammeter during the test shall simultaneously be compared to that indicated on the meter of the magnetic particle equipment. The equipment meter shall agree (within 5% of full scale) with the current measured by the calibration meter.

c) Automated Equipment – Automatic powder blowers or any other form of forced air, other than from a hand-held bulb, shall not be used for the application or removal of dry magnetic particles.

d) Surface Preparation – Prior to inspection, surfaces shall be dry and free from any contamination which might interfere with the proper formation or interpretation of the magnetic particle patterns. With the exception of undercuts which are within specification allowances, the contour of welds shall blend smoothly and gradually into the base metal. Surface irregularities shall be removed to the extent that they will not interfere with interpretation of the test results. The final magnetic particle inspection shall be performed in the final surface and heat-treated conditions for the component.

4. The Contractor shall extend to the Government the full coverage of any standard warranty normally offered in a similar sale, provided such warranty is available at no additional cost to the Government. (See Contract Data Requirements List (DI-SESS-81639) Warranty Documentation)

5. Failure to provide the Contract Data Requirements Lists (CDRLs) above shall be cause for rejection of this material.

6. **Changes** to specifications or technical requirements are **NOT ALLOWED** without Shipyard (Code 2370.21) approval via the Administrative Contracting Officer (ACO).

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