



## LHFCRC-1, REV 5

# SUBCONTRACTOR SPECIAL INSTRUCTIONS

### **Special Instructions for Subcontractors Providing Heat Treatment; Rough and Finish Machining; Associated Visual, Dimensional or Nondestructive Inspections; Certification or Test Reporting; and Packaging and Shipment of Lehigh Heavy Forge (LHF) Corporation Products.**

#### 1. Inspection at Subcontractor Facility

- 1.1 Lehigh Heavy Forge and/or government reserves the right to audit processes and systems and to verify the conformance of the item(s) and services to the purchase order at any location and any stage of development or manufacturer.

#### 2. Specification Effectivity

- 2.1 When specifications are invoked (i.e., drawing or specifications listed in the purchase order) and the revisions are NOT indicated, the latest revision issues prior to the purchase order effective date.

NOTE: The revision effectivity date is NOT applicable if the revision IS indicated within the purchase order. Revision requirements may not be the latest revision available.

#### 3. Order of Precedence

- 3.1 In the event of any inconsistency in the ordering data, the purchase order takes precedence in conflicts and disputes, including existing specification or drawing requirements.
- 3.2 In the event inconsistencies are discovered the subcontractor shall contact Lehigh Heavy Forge to resolve the conflict. The subcontractor shall not proceed and except at own risk.
- 3.3 Products shall be completed to the drawing(s), specification(s), procedure(s) and/or work instruction(s) specified in the purchase order documents. The supplier shall assume all responsibility when work is performed to unapproved drawings.

#### 4. Notification of Nonconformance

- 4.1 Supplier shall provide Lehigh Heavy Forge immediate informal notification (i.e. phone call or email) with confirmed receipt (verbal or email response acknowledgement) within 24-hours of discovery of any nonconformance or latent defect discovered after delivery to Lehigh Heavy Forge.
- 4.2 A formal Letter of Advisement (LOA) is required to be sent to Lehigh Heavy Forge following immediate informal notification.

#### 5. Supplier Corrective Action Request (SCAR)

- 5.1 Supplier corrective action requests may be requested by Lehigh Heavy Forge for significant or systemic nonconformances. SCARs responses shall include root cause(s), corrective action(s) and preventive action(s), and verification of effectiveness.

5.2 SCARs shall be provided within time frame specified on the SCAR. Extensions to the required due date may be requested

6. **Documentation**

6.1 Corrections of official records shall be made by drawing a single line through the incorrect entry, and initialed and dated (in ink) by the original personnel or supervisor that made the entry.

6.2 The use of ditto marks and continuation arrows are not acceptable for repeated data, initials or signatures.

7. **Record Retention & Destruction**

7.1 Test records shall be retained for a period of 7-years after completion of the last item of the contract.

7.2 Test records shall be made available to Lehigh Heavy Forge and/or government within 36-hours upon request.

7.3 Destruction of test, inspection, quality records, and objective quality evidence must be approved by Lehigh Heavy Forge.

8. **General**

8.1 Suppliers (management and employees) are contractually obligated to meet all purchase order requirements. Suppliers shall flow down this requirement to all sub-tier suppliers.

8.2 Subcontractors may not subcontract any part of this work being performed for LHF while in their facility without first obtaining written authorization from the Lehigh Heavy Forge Purchasing department.

8.3 No welding or other repairs shall be performed without the written approval of Lehigh Heavy Forge Technology Department.

9. **Heat Treatment**

9.1 Subcontractors performing heat treatment shall review with LHF Technology their proposed processes to ensure proper material coverage and body finish material allowances.

9.2 The heat treatment shall be performed in accordance with the proposed and accepted plan.

9.3 The subcontractor shall certify that the heat treatment was performed in accordance with the heat treatment plan. When required, the subcontractor will provide copies of furnace logs, temperature recorder strip charts or other objective evidence of the successful completion of the heat treatment cycle.

9.4 Hardness and other required tests after heat treatment shall be performed after appropriate material has been removed from heat-treated surfaces to account for surface decarburization. The Subcontractor and LHF Technology will agree on the metal removal and test plans.

9.4.1 On roll products only, rolls shall not be finish turned or ground to finish body diameter without approval of the hardness and/or retained austenite test results.

## 10. **Rough and Finish Machining**

- 10.1 Rough and/or finish machining shall be performed in accordance with drawings provided by LHF to the subcontractor. Drawing identification and traceability to the purchase order shall be established by LHF and maintained by the subcontractor.
- 10.2 Drawing tolerances and finishes shall supersede standard tolerances and finishes that may be in place at the subcontractor's shop.
- 10.3 Challenges to the drawing requirements, including clarity, readability and the presence or absence of tolerances on critical dimensions shall be identified and brought to the attention of LHF Purchasing prior to the start of any work, whenever possible.
- 10.4 Material Data Sheets, Certified Test Reports or Certificates of Conformance are required for all work completed by the subcontractor. See below for additional requirements.
- 10.5 Supplemental Roll-Specific Requirements:
  - Inboard and outboard bearing pads on end of a roll shall be mated within .0005".
  - Bearings on the operator and drive end of a roll shall be mated within .001".
  - Surface finish for hardness shall not exceed 50 Ra.

## 11. **Associated Visual, Dimensional or Nondestructive Inspections**

- 11.1 Visual and/or dimensional inspections are required for all heat treatment, rough and finish machining Purchase Orders.
- 11.2 Subcontracted heat treatment orders require a visual inspection of all heat-treated surfaces to ensure the surfaces are free of cracks or other injurious defects resulting from or occurring during the heat treatment cycle.
- 11.3 Dimensional inspections after heat treatment may be required to ensure conformance to drawing and acceptance of any distortion.
- 11.4 Subcontractors performing ultrasonic testing as part of the purchase order requirements shall perform the testing in accordance with the LHF procedure specified in the purchase order. A test report shall be issued to LHF Technology, as appropriate, as soon as the test is completed. The test shall be performed before the product is finished turned.
- 11.5 When required, nondestructive or other inspections shall be performed by inspection personnel qualified to industry or contract specific specifications or standards.

## 12. **Certification and Test Reporting**

- 12.1 Subcontractors shall supply test reports as applicable or required. LHF Technology may specify the report forms required for each product unless some other arrangement has been agreed to between the subcontractor and LHF.
- 12.2 Material certification data (chemical analysis, mechanical or physical testing) shall be recorded on official letterhead and shall bear the name, title, and signature of the authorized representative.
- 12.3 When the subcontractor completes the applicable reports, three (3) copies of the Inspection Reports are to be forwarded to LHF for review and approval prior to shipment. Any product or process deviations by the subcontractor shall be highlighted on the applicable report.
- 12.4 The following information shall be on the inspection report as applicable for roll product:
  - a. Milling Report - Insuring flats are on center and are to specified size.

- b. Journal & Neck Dimensions - verifying the diameters are to specification.
- c. Land Diameters - Insuring shrink diameters and special grind lengths are to spec.
- d. Finish Grind TIR Report - Reporting the Total Indicator Runout (TIR) check results.
- e. Final Hardness - Recording final hardness test results. All hardness tests shall be performed using Equotip LD - NO CONVERSIONS - unless instructed otherwise.
- f. Dimensional Report - Record of all roll dimensions not previously covered.
- g. Final Ultrasonic Report - if applicable
- h. Hardness & Retained Austenite Report - Testing done after heat treatment - if applicable.

### 13. **Packaging & Shipping Preparation**

13.1 Subcontractors shall prepare the product for shipment in accordance with the purchase order requirements.

13.1.1 The following requirements (at a minimum) are applicable to roll products only:

- a. All machined surfaces must be 100% coated with a rust preventing coating.
- b. Suggested coating is Rust Veto #342 or any special coating required on the purchase order.
- c. Bearing journal diameters are to be protected with paper backed aluminum foil and then covered with cardboard.
- d. Only plain waterproof wrapping and tape may be used. NO SUBCONTRACTOR LOGOS OR NAMES ARE ALLOWED ON ANY PACKAGING MATERIALS.
- e. All straight bearing journal surfaces must be additionally protected with hardboard and banding. Note: LHF uses 1/8 inch thick standard Masonite.
- f. Product must be tarp protected during shipment. Note: no binders are permitted across bearing journal surfaces.

13.1.2 Subcontractors shall identify all products in accordance with LHF furnished requirements. This may include, as appropriate and stated on the purchase order or instructions:

- a. LHF product or piece identification
- b. Special customer identification
- c. Special markings on one or both ends of the product
- d. Color coding or other surface coating requirements

13.2 Subcontractors must fax a copy of the Bill of Lading or Delivery Report to LHF Purchasing Department as proof of shipment or delivery to the customer.

### 14. **Authorization for Shipment**

14.1 LHF will approve all products for shipment to a customer. A certified test report must be prepared for each product and forwarded to the appropriate LHF personnel, as directed in the purchase order. If the product is released for shipment to the customer, LHF personnel will forward to the subcontractor, the customer's approval to ship with a release for the product to be shipped. The subcontractor shall include the customer's shipment approval and a copy of the subcontractor's approved test report or the LHF test report with the product shipping documents when the product is shipped. LHF manifests, as appropriate, must be used for shipping products to the customer.

### 15. **Other Commercial / Contractual Requirements**

15.1 Subcontractors are required to procure and maintain fire and extended coverage insurance in a company or companies satisfactory to LHF Purchasing department in such amounts as may

be necessary to protect the full interest of LHF's property as long as it remains in the possession of the subcontractor. The subcontractor shall cause LHF to be added as a named insured to such policy or policies and shall cause a Certificate of Insurance to be sent to the LHF Purchasing department.