1. SCOPE:

Specified herein are the quality and inspection requirements for steel forgings for high pressure components, which are supplementary to the basic component specification when so indicated by reference.

2. QUALITY REQUIREMENTS:

The quality of the steel forgings provided under this specification shall be determined by liquid penetrant examination & ultrasonic inspection techniques. The minimum acceptable quality requirements for these respective inspection methods are listed below. Where these methods may yield conflicting or contrary indications as to the severity of a defect, the most severe indication will govern the acceptance and/or disposition of the forging in question.

a. Liquid Penetrant Indications. Maximum permissible indications of a liquid penetrant examination made in accordance with ASTM E165-65 shall be as specified in paragraph N-627.7 of Section III of the ASME Boiler and Pressure Vessel Code except that weld repair shall be as specified under Section 4 of this document.

b. Ultrasonic Indications. Maximum defect severity for all discontinuity types shall be Class AA as indicated by MIL-I-8950B.

3. INSPECTION OF STEEL FORGINGS:

a. General.

(1) Vendor's Responsibility. The various inspections of steel forgings as stipulated herein shall be the responsibility of the vendor. However, it is not the intent of this specification to exclude the use or application of any other inspection procedures or techniques, not specified herein, that may be necessary or desirable in establishing the soundness and servicability of any forging provided hereunder. All cost associated with the inspections shall be borne by the vendor and be included in the bid or contract price of the component.

(2) Purchaser Surveillance. The Purchaser, or Purchaser's authorized representative, shall have access to witness all phases of the inspections and shall have a right to all data and results of such inspections. These data and results must be made available to the Purchaser immediately upon completion or termination of any inspection procedure. All pertinent data relating to their interpretation shall be transferred to and become the property of the Purchaser.

If the Purchaser or his authorized representative has reason to believe that the requirements of this specification are not being met, he (the Purchaser or his authorized representative) can suspend the use of any questionable material, equipment, procedures, personnel, etc., on work covered by this specification until compliance with the requirements of this specification is judged satisfactory.

(3) Point of Inspection. The forgings are to be subjected to the inspections as outlined herein upon receipt from the forge shop or prior to any finished machining operations. Inspection of the forging at this point does not relieve the vendor of the responsibility of providing a component that satisfies the intent and requirements of the basic component specification.

b. Liquid Penetrant Inspection. External and internal surfaces of each forging shall be subjected to liquid penetrant inspection. The forging shall be acceptable on the basis of the requirements of paragraph N627.7 of Section III of the ASME Boiler and Pressure Vessel Code.

c. Ultrasonic Inspection. The forging shall be subjected to an ultrasonic examination in accordance with ASTM A388-67 using the longitudinal beam technique. The types and degrees of defects shall be judged by MIL-I-8950B, Class AA.

4. REPAIR BY WELDING:

Repairs of defects by welding shall be in accordance with the requirements of paragraph UF-37 of Section VIII of the ASME Boiler and Pressure Vessel Code. The procedure qualification shall be performed on test specimen of forged material of the same specification and subjected to the heat-treatment before and after welding as will be applied to the work. All welders and operators performing this welding shall also be qualified in accordance with Section IX. When repair welding is done after heat treatment of the forging. The forging shall be postweld heat treated.

| SYM | ZONE | DESCRIPTION | DATE | APPROVED |
|---|---|---|---|---|
| | | PRELIMINARY RELEASE | | |

REVISIONS

| SIGNATURES | DATE |
|---|---|
| DRAWN | |
| CHECKED WJH | |
| ENGINEER | 6-11-70 |
| ISSUED JUN 17 1970 | |
| SUBMITTED | 6-11-70 |
| APPROVED | 6/15/70 |
| USED ON 54000-D001 Sht. GC1 | |

NATIONAL AERONAUTICS SPACE ADMINISTRATION
GEORGE C. MARSHALL SPACE FLIGHT CENTER
MISSISSIPPI TEST FACILITY BAY ST. LOUIS, MISSISSIPPI

MTSD GENERAL ELECTRIC

FORGING, STEEL
QUALITY AND INSPECTION REQUIREMENTS

SIZE | DWG. NO. 54000-GC11 | REV.

AUTHORITY WR G21233 | SHEET 1 of 2

5. FREQUENCY OF INSPECTION:

Where more than one forging of a particular design is produced, each of the first five forgings shall be inspected as outlined herein. Where more than five forgings are being produced, the examination shall be performed on the first five, plus one additional forging to represent each five additional forgings. If this additional forging proves to be unacceptable, each of the remaining four forgings in the group shall be inspected.

6. IDENTIFICATION AND MARKING:

Each forging shall be marked with the manufacturer's name and forging identification, including material designation.

7. RECORDS:

The manufacturer shall maintain a quality control system adequate to assure the Purchaser or his authorized representative that all of the requirements of this specification have been and are continuously being met. The quality control system shall include preparing and maintaining written records of at least the following listed items as required by this specification for each forging produced:

a. Chemical Analysis
b. Tensile Properties and Impact Properties
c. Heat Treatment
d. Visual and Dimensional Inspection Results
e. Inspection Results
f. Repair welding

| SYM | ZONE | DESCRIPTION | DATE | APPROVED |
|---|---|---|---|---|
| | | REFER TO SHEET NO. 1. | | |

REVISIONS

| SIGNATURES | DATE |
|---|---|
| DRAWN | |
| CHECKED W&H | |
| ENGINEER W T Hensley | 6-11-70 |
| ISSUED JUN 17 1970 | |
| SUBMITTED [illegible] | 6-11-70 |
| APPROVED S. A. Fabrion | 6/15/70 |
| USED ON 54000-D001 Sht. GC-1 | |

NATIONAL AERONAUTICS SPACE ADMINISTRATION
GEORGE C. MARSHALL SPACE FLIGHT CENTER
MISSISSIPPI TEST FACILITY BAY ST. LOUIS, MISSISSIPPI

MTSD GENERAL ELECTRIC

FORGING, STEEL
QUALITY AND INSPECTION REQUIREMENTS

SIZE | DWG. NO. 54000-GC11 | REV.

AUTHORITY WR G21233 | SHEET 2 of 2