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INCH-POUND
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COMMERCIAL ITEM DESCRIPTION

TESTER, EXHAUST GAS TEMPERATURE CIRCUIT

The General Services Administration has authorized the use of this Commercial Item Description for all federal agencies.

1. SCOPE. This commercial item description (CID) covers the requirements for a portable, self-contained tester that checks thermocouples, thermal switches, and continuous wire fire detection systems. The tester simulates operating conditions of the units under test (UUT).

2. SALIENT CHARACTERISTICS.

2.1 General. The exhaust gas temperature circuit tester (EGTCT) shall be a user-friendly unit capable of testing the correct operation of thermocouples, thermal switches and continuous wire fire and overheat detection loops. The tester shall be capable of simulating actual operating conditions by supplying a controlled heat to the thermocouples, thermal switches and fire loops. The tester shall be capable of heating probes to an operator controlled temperature and controlling the temperature of the probes using a temperature control function to National Institute of Standards and Testing traceable standards. The tester shall monitor probe temperature and thermocouple output characteristics in order to determine whether the thermocouple is defective. The tester shall test thermal switches by bringing switches to the control temperature and allowing the switch to actuate (open or close) depending on its normal operating position. The tester shall test fire loops by applying a controlled temperature to the loop and monitoring cockpit indications.

2.2 Physical characteristics. The EGTCT shall not weigh more than 50 pounds. The preferred configuration will have the main container the approximate size of commercial airline carry-on luggage. The nominal physical characteristics are:

LENGTH	9.700	INCHES NOMINAL
HEIGHT	14.000	INCHES NOMINAL
WIDTH	12.000	INCHES NOMINAL

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2.3 Measuring and indicating devices. All measuring and indicating devices shall have a degrees Fahrenheit (F) scale and degrees Celsius (C) for measuring temperature.

2.4 Power. The EGTCT shall operate on power sources of 115 VAC 50 to 400 Hz or 230 Volts AC (VAC) 50 to 400 Hz and shall have protection against the inadvertent application of the incorrect power source. The EGTCT shall have a 20 amperes (amp) maximum rating at both 115 VAC and 230 VAC and shall have ground fault protection at both the 115 VAC and the 230 VAC.

2.4.1 Steady-state conditions. The EGTCT shall operate and maintain the specified performance and accuracy within a steady-state voltage tolerance band of ±10 percent and within a steady-state frequency tolerance band of ± 5 percent with no detrimental effect on equipment performance.

2.4.2 Transient-state conditions. The EGTCT shall not experience alterations of characteristics due to transient-state conditions lasting up 100 milliseconds when recovery to the steady-state conditions is within five seconds. Operation for transient-state conditions which persist longer than five seconds shall be as required for interruption of source power.

2.4.3 Grounding. The EGTCT shall include all of the necessary equipment and provisions for proper grounding of the unit.

2.5 Electromagnetic interference (EMI). The EGTCT shall be in accordance with the following radiated emission and susceptibility requirements of MIL-STD-461: RE102 and RS103.

2.6 Operating environment. The EGTCT shall be capable of operating with relative humidity at or less than 90%.

2.6.1 Operating temperature. The EGTCT shall be capable of operating from 0 °F to 122 °F ambient temperature.

2.7 Thermocouples. The thermocouples shall be K-type, not integral to the heater blanket, and be accurate to within ±5 °F when assembled to a 50 foot length. The tips shall be welded.

2.7.1 Connecting wires. All connecting wires and leads shall be designed to eliminate air leak paths, i.e., fused and non-porous insulation and covers, during vacuum bagging operations. All wires shall have stress reliefs at the stress points.

2.8 Display panel. Displays and indicators are visible outdoors in sunlight without hoods or special screens and indoors under less than 20 to more than 100 foot candles of illumination at the face of the instrument when viewed at an angle of 45 degrees or less from the plane of instrument face.

2.9 Housing. The EGTCT shall be housed in a ruggedized case that shall prevent damage during operation and transportation.

2.9.1 Identification plate. An identification plate in accordance with MIL-STD-130 shall be securely attached to the EGTCT in a readily accessible location. The identification plate shall contain the following information: nomenclature, part number, serial number, date of

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manufacture, manufacturer's name, Commercial and Government Entity (CAGE) code, date of warranty expiration, and National Stock Number (NSN). The EGTCT and any of its components for which the Government's unit cost is more than $5,000, is serially managed the procuring agency determines is mission essential, shall have Unique Identification (UID) (also known as Item Unique Identification (IUID)) information permanently affixed on or near the respective identification plate(s), marked in accordance with MIL-STD-130. UID information shall be included as both a bar code and human readable markings.

2.10 Calibration. The EGTCT shall not require calibration more than once every year and it shall not require any special equipment, rooms or chambers to accomplish the calibration. The mean time to calibrate shall be 2 hours or less. Calibration standards shall be traceable to NIST.

2.11 Component protection. All space in which work is performed during operation, service, and maintenance shall be free of hazardous protrusions, sharp edges, or other features which may cause injury to personnel. All rotating and reciprocating parts and all parts subject to high operational temperatures or subject to being electrically energized, that are of such nature or so located as to be hazardous to personnel, shall be guarded or insulated to eliminate the hazard.

2.12 Foreign object damage (FOD). All loose metal parts, such as pins or connector covers, shall be securely attached to the EGTCT with wire ropes or chains. "Dog tag" style beaded chains shall not be provided. Removable panels, if provided, shall be attached with captive fasteners.

2.13 Special tools. The design of the item shall minimize the requirement for special tools. All special tools shall be provided with, and stored on, the EGTCT. A special tool is defined as a tool that is not commercially and readily available from a source other than the OEM.

2.14 Workmanship. The EGTCT, including all parts and accessories, shall be constructed and finished in a thoroughly workmanlike manner. Workmanship objectives shall include freedom from blemishes, defects, burrs and sharp corners and edges; accuracy of dimensions, surface finish, and radii of fillets; thoroughness of welding, painting, and riveting; marking of parts and assemblies; and proper alignment of parts and tightness of assembly fasteners.

2.14.1 Bolted connections. Bolt holes shall be accurately punched or drilled and shall be deburred. Threaded fasteners shall be tight and shall not work loose during testing or service usage.

2.14.2 Riveted connections. Rivet holes shall be accurately punched or drilled and shall be deburred. Rivets shall be driven with pressure tools and shall completely fill the holes. Rivet heads shall be full, neatly made, concentric with the rivet holes and in full contact with the surface of the component.

2.14.3 Cleaning. The EGTCT shall be thoroughly cleaned. Loose, spattered, or excess solder; welding slag; stray bolts, nuts, and washers; rust; metal particles; pipe compound; and other foreign matter shall be removed during and after final assembly.

3. REGULATORY REQUIREMENTS.

3.1 Recycled recovered materials. Recycled, recovered, or environmentally preferable materials shall be used to the maximum extent possible provided that the material meets or

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exceeds the operational and maintenance requirements, and promotes economically advantageous life cycle costs. The offeror/contractor is encouraged to use recovered materials to the maximum extent practicable, in accordance with paragraph 23.403 of the Federal Acquisition Regulation (FAR). However, used, rebuilt, or refurbished items shall not be provided.

3.2 Green Procurement Program. Green Procurement Program (GPP) is a mandatory federal acquisition program that focuses on the purchase and use of environmentally preferable products and services. GPP requirements apply to all acquisitions using appropriated funds, including services and new requirements. FAR 23.404(b) applies and states the GPP requires 100% of EPA designated product purchase that are included in the Comprehensive Procurement Guidelines list that contains recovered materials, unless the item cannot be acquired: a) competitively within a reasonable timeframe; b) meet appropriate performance standards, or c) at a reasonable price. The prime contractor is responsible for ensuring that all subcontractors comply with this requirement.

4. PRODUCT CONFORMANCE PROVISIONS.

The products provided shall meet the salient characteristics of this Commercial Item Description, conform to the producer's own drawings, specifications, standards, and quality assurance practices, and be the same product offered for sale in the commercial marketplace, modified as necessary to comply with the requirements herein. The Government reserves the right to require proof of such conformance.

4.1 Classification of inspections. The inspection requirements specified herein are classified as follows:

a. First production inspection (see 4.2).

b. Conformance inspection (see 4.3).

4.2 First production inspection. The first production EGTCT shall be subjected to the analyses, demonstrations, examinations, and tests described in 4.5.1 through 4.5.9. The contractor shall provide or arrange for all test equipment and facilities.

4.3 Conformance inspection. Each production EGTCT shall be subjected to the examination described in 4.5.1.

4.4 Inspection requirements.

4.4.1 General inspection requirements. Apparatus used in conjunction with the inspections specified herein shall be laboratory precision type, calibrated at proper intervals to ensure laboratory accuracy.

4.4.2 Data. During all testing specified herein, at least the following data, unless not applicable, shall be recorded at intervals not to exceed 30 minutes. Additional data or shorter intervals shall be provided as appropriate for any specific test.

a. Date.

b. Time started.

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c. Time finished.

d. Ambient temperature.

e. Ambient humidity.

4.4.3 Test rejection criteria. Throughout all tests specified herein, the EGTCT shall be closely observed for the following conditions, which shall be cause for rejection.

a. Failure to conform to design or performance requirements specified.

b. Any spillage or leakage of any liquid, including fuel, coolant, lubricant, or hydraulic fluid, under any condition, except as allowed herein.

c. Structural failure of any component, including permanent deformation, or evidence of impending failure.

d. Evidence of excessive wear. If excessive wear is suspected, the original equipment manufacturer's (OEM's) specifications or tolerances shall be utilized for making a determination.

e. Evidence of corrosion or deterioration.

f. Misalignment of components.

g. Conditions that present a safety hazard to personnel during operation, servicing, or maintenance.

4.5 Test methods.

4.5.1 Examination of product. Each EGTCT shall be examined to verify compliance with the requirements herein prior to accomplishing any other demonstrations or tests listed in 4.5. A contractor-generated, Government-approved checklist (part of the test procedure) shall be used to identify each requirement not verified by an analysis, certification, demonstration, or test, and shall be used to document the examination results. Particular attention shall be given to materials, workmanship, dimensions, surface finishes, protective coatings and sealants and their application, welding, fastening, and markings. Proper operation of each EGTCT function shall be verified. Certifications and analyses shall be provided in accordance with Table I. Each production EGTCT shall be inspected to a Government-approved reduced version of the checklist.

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TABLE I: Certifications and analyses

Paragraph	**Required Certification or Analysis**
2.6 Operating environment	Contractor certification of compliance with 2.6
2.7.1 Connecting wires	Contractor certification of compliance with 2.7.1
2.10 Calibration	Contractor certification of compliance with 2.10. Contractor shall provide calibration schedule.
2.11 Component protection	Contractor certification of compliance with 2.11
2.12 Foreign object damage (FOD)	Contractor certification of compliance with 2.12
2.13 Special Tools	Contractor certification of compliance with 2.13
2.14 Workmanship (including sub-paragraphs)	Contractor certification of compliance with 2.14 and sub-paragraphs

4.5.2 Electromagnetic interference test. A first production EGTCT shall be tested in accordance with MIL-STD-461: RE 102 and RS 103 to demonstrate compliance with 2.5.

4.5.3 Weight and dimension tests.

4.5.3.1 Weight. The weight of a first production EGTCT shall be measured to demonstrate compliance with the weight requirement of 2.2.

4.5.3.2 Dimension measurement. A first production EGTCT shall be measured to demonstrate compliance with the dimensional requirements of 2.2.

4.5.4 Measuring and indicating devices test. A first production EGTCT shall be visually inspected to demonstrate compliance with 2.3.

4.5.5 Power test. A first production EGTCT shall be tested to demonstrate compliance with 2.4 and all sub-paragraphs of 2.4.

4.5.6 Electromagnetic interference test. A first production EGTCT shall be tested in accordance with MIL-STD-461: RE 102 and RS 103 to demonstrate compliance with 2.5.

4.5.7 Thermocouples. A first production EGTCT shall be visually inspected and tested to demonstrate compliance with 2.7 and 2.7.1.

4.5.8 Display Panel. A first production EGTCT shall be tested to demonstrate compliance with 2.8.

4.5.9 Maintainability demonstration. All recommended preventive maintenance, and annual calibration tasks shall be performed and the task times shall be recorded. The recommended frequencies of the preventive maintenance tasks and the times recorded to accomplish the tasks

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shall be used to develop an expected value of preventive maintenance time per measure of use, such as calendar time or hours of operation. It shall be demonstrated that the forces required do not exceed those allowed in MIL-STD-1472. All preventive maintenance tasks recommended to be performed daily and at the routine PMI shall also be performed by personnel wearing arctic mittens.

5. PACKAGING.

5.1 Preservation, packing, and marking. Preservation, packing, and marking shall be as specified in the contract or order.

6. NOTES

6.1.1. Source of documents.

6.1.2. Department of Defense and Federal documents. Military Specifications, Standards, and Handbooks referenced herein may be obtained at https://assist.dla.mil or available from the Standardization Documents Order Desk, 700 Robbins Ave, Bldg. 4, Section D, Philadelphia, PA 19111-5094.

6.1.3. FAR. FAR and DFARS may be obtained from the Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954. Electronic copies of the FAR may be obtained from https://www.acquisition.gov/far/ .

6.2 Key Words

Portable
Self-contained
User-friendly unit

MILITARY INTERESTS:

Custodians:
Air Force - 84

Preparing Activity:
Air Force - 84

Reviewers:
Air Force - 99

Agent:
Air Force - 99

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