

ARDEC
Combat Maintenance Systems Engineering
Description for Purchase
For
Tool Kit, Refrigeration Service Accessory

1. SCOPE

1.1 Scope. This Description for Purchase, herein called DFP or specification, describes the requirements for a Refrigeration Service Accessory Tool Kit and its contents. The Refrigeration Service Accessory Tool Kit contains supplemental tools required by refrigeration repairmen to install and repair air conditioning and refrigeration systems.

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3, 4, or 5 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements of documents cited in sections 3, 4, or 5 of this specification, whether or not they are listed.

2.2 Government documents.

2.2.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those in effect as of the date of this specification

COMMERCIAL ITEM DESCRIPTIONS

A-A-59486 - Padlock Set (Individually Keyed Or Keyed Alike)

(Copies of these documents are available online at <https://assist.daps.dla.mil/quicksearch/> or from the Department of Defense Single Stock Point (DODSSP), Building 4 / Section D, 700 Robbins Avenue, Philadelphia, PA 19111-5098.)

2.3 Non-Government publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those in effect as of the date of this specification.

AMERICAN SOCIETY FOR TESTING AND MATERIALS

(Copies of ASTM documents may be purchased from www.astm.org or ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.)

2.4 Order of precedence. Unless otherwise noted herein or in the contract, in the event of a conflict between the text of this document and the references cited herein (except for related specification sheets), the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Preproduction Verification. Unless specified in the contract or delivery order, the contractor shall furnish one or more kits for preproduction verification inspection in accordance with the contract or delivery order. The kits submitted shall be in accordance with the requirements of this specification. The approved preproduction sample and the production items shall be in accordance with the terms of the contract. Approval of the preproduction verification shall not relieve the contractor of the responsibility to furnish kits in accordance with the requirements of this specification. All items supplied under this contract shall be identical to the preproduction verification sample; including the packaging requirements specified in the contract or delivery order.

3.2 Components. The brand name or equal components identified under this paragraph shall be supplied in the quantities as stated in Table 1. Each item is described separately in the paragraph indicated in the first column on the left side of the table. The contractor shall submit a complete list of the individual tool kit subset components in accordance with Contract Data Requirements List (CDRL) A0003. The list shall include: Original Equipment Manufacturer (OEM) CAGE code, part number, nomenclature, and unit of issue.

Table 1

Item	Item Description	Qty	FSC	Wty
3.2.1	Close quarters tubing cutter, 3/4 inch	1	5110	L
3.2.2	Close quarters tubing cutter, 1/4 inch to 1/8 inch	1	5110	L
3.2.3	Close quarters tubing cutter, 1/8 inch to 5/8 inch	1	5110	L
3.2.4	Brazing outfit	1	3439	M
3.2.5	Solenoid valve operating magnet	4	5340	M
3.2.6	Welding gloves	1 pr	8415	M
3.2.7	Electronic leak detector	1	4940	M
3.2.8	Noncontact thermometer	1	6685	M
3.2.9	Digital vacuum gauge	1	6685	M
3.2.10	Belt tension gauge	1	6635	M
L – Manufacturer's stated lifetime warranty				
M – Manufacturer's stated commercial warranty				

3.2.1 Close quarters tubing cutter, 3/4 inch. The tubing cutter shall be for use in restricted spaces on small diameter hard and soft copper, aluminum, brass and plastic tubing. The cutter shall have grooved rollers for close-to-flare cuts. The tubing cutter shall cut tubing with outside diameters of 3/16-inches to 15/16-inches. The cutter shall have a knurled feed screw knob to control the cutting pressure. A spare cutter wheel shall be furnished with the tubing cutter. Ridgid Model 104 or equal with E-3469 cutter wheel.

3.2.2 Close quarters tubing cutter, 1/4 inch to 1/8 inch. The tubing cutter shall be for use in restricted spaces on small diameter hard and soft copper, aluminum, brass and plastic tubing. The cutter shall have grooved rollers for close-to-flare cuts. The tubing cutter shall cut tubing with outside diameters of 1/4-inches to 1-1/8-inches. The cutter shall have a knurled feed screw knob to control the cutting pressure. The tubing cutter shall have a spare cutter wheel stored inside the feed screw knob. Ridgid model 101 or equal.

3.2.3 Close quarters tubing cutter, 1/8 inch to 5/8 inch. The tubing cutter shall be for use in restricted spaces on small diameter, hard and soft copper, aluminum, brass and plastic tubing. The cutter shall have grooved rollers for close-to-flare cuts. The tubing cutter shall cut tubing with outside diameters of 1/8-inches to 5/8-inches. The cutter shall have a knurled feed screw knob to control the cutting pressure. A spare cutter wheel shall be furnished with the tubing cutter. Ridgid Model 103 or equal with E-3469 cutter wheel.

3.2.4 Brazing outfit. The brazing outfit shall consist of a torch handle with attached oxygen and fuel gas hoses no less than 10 feet long, a single flame tip, a twin flame tip, a "C" style tip, a heating tip, and adapters that will adapt the hoses to A or B style regulator connections. The torch outfit shall be capable of being used with acetylene. The single flame tip shall have heat output of no less than 7,360 BTU/hour and brazing capacity of 1/2 to 3/4 inch copper pipe. The twin flame tip shall have heat output using acetylene of no less than 12,200 BTU/hour and brazing capacity of 5/8 to 1-3/8 inch copper pipe. The twin flame tip shall allow equal size flames to be applied simultaneously to opposite sides of the tubing. The "C" style tip shall have heat output of no less than 12,350 BTU/hour and brazing capacity of 1/2 to 1-1/8 inch copper pipe. The "C" style tip shall allow even heating around all sides of the pipe, tubing or fitting simultaneously. The heating tip shall have heat output using acetylene of no less than 13,760 BTU/hour and brazing capacity of 1/2 to 1-5/8 inch copper pipe. An adapter shall be furnished so that the oxygen torch hose can be attached to a regulator with 9/16-18 RH outlet threads and to a regulator with 3/8-24 RH outlet threads. An adapter shall be furnished so that the acetylene torch hose can be attached to a regulator with 9/16-18 LH outlet threads and a regulator with 3/8-24 LH outlet threads. The torch handle shall have valves to shut off and regulate the fuel gas and the oxygen. Smith® Quickbraze Air Conditioning/Refrigeration Brazing Outfit 23-5005A or equal.

3.2.5 Solenoid valve operating magnet. The solenoid valve operating magnet shall allow the manual opening and closing of solenoid valves when the valve is not under power. The magnet shall have a nominal 18 mm (3/4-inch) hole through the center to fit around the stem of the solenoid valve. Refco SVOM-18 Solenoid Valve Operating Magnet or equal.

3.2.6 Welding gloves. The gloves shall be for MIG welding and shall be made of heavy-duty top-grain cowhide. The gloves shall be unlined, have a wing thumb, seamless forefingers, a 4 inch gauntlet cuff and shall be lock stitched with Kevlar® thread. The gloves shall be furnished in large size. John Tillman and Company, Inc. 1350 or equal.

3.2.7 Electronic leak detector. The electronic leak detector shall be a hand-held leak detector used to detect refrigerant leaks in air conditioning and refrigeration systems. It shall have a sensitivity selection switch which allows it to be used with CFCs and HCFCs at one setting and HFCs at the other. The leak detector shall be capable of detecting refrigerant leaks of 1/2 ounce per year or smaller. The leak detector shall have audible and visual leak indicators, a low battery indicator, a volume control, a threshold balancing control and a flexible gooseneck probe no less than 16 inches long which holds its position for one-handed operations. When the leak detector is not being used, the probe shall wrap into a retaining clip on the back of the case. The leak detector shall be certified by a nationally recognized testing laboratory to meet SAE J1627 for R-12 and R-134a refrigerants. The leak detector shall operate from AA alkaline batteries which shall be included. SPX Service Solutions/Robinair 16600 or equal.

3.2.8 Noncontact thermometer. The thermometer shall allow temperature readings to be taken from a distance of up to 2 meters (6 feet). The thermometer shall have a range of -20°F to 932°F (-30°C to 500°C) or greater. It shall be accurate to $\pm 1^{\circ}\text{C}$ ($\pm 2^{\circ}\text{F}$) from 10°C to 30°C (50°F to 86°F), $\pm 1.5\%$ of reading or $\pm 1.5^{\circ}\text{C}$ ($\pm 3^{\circ}\text{F}$) whichever is greater over the balance of the range. The thermometer shall have a laser indicator to indicate the area of measurement. The thermometer shall have a backlit display with a resolution of 0.5°F or less. The display shall be selectable to allow the temperature to be read in °F or °C and shall show current and maximum readings. The thermometer shall be battery operated which shall be included. A storage pouch shall be included. Raytek MiniTemp MT6 or equal.

3.2.9 Digital vacuum gauge. The digital vacuum gauge shall sense and indicate vacuums in the range of 760,000 to 1 micron. The gauge shall have no greater than 1 micron resolution below 1000 microns and accuracy of $\pm 20\%$ of reading or greater. It shall operate at temperatures of 32°F to no less than 125°F. The digital vacuum gauge shall be battery powered by a single battery, self calibrating, have automatic temperature compensation, and automatic battery condition check and compensation. The vacuum gauge shall connect to a 1/4-inch male flare connection. The vacuum gauge shall have a sensor with no less than 6 feet of coiled sensor cable. The digital vacuum gauge shall be furnished in a molded plastic case and shall be furnished with a coupler and a ball valve to isolate the gauge during system pressurization. Ritchie Engineering Company, Inc., Yellow Jacket Products Division 69075 SuperEvac LCD Vacuum Gauge with 69071 coupler and 69067 ball valve or equal.

3.2.10 Belt tension gauge. The gauge shall be for measuring the tension on V-belts up to 7/8 inches top width. The gauge shall read in both pounds and kilograms and shall measure belt tensions of 30 to 160 pounds and 15 to 75 kg. The gauge shall have a clip for holding the gauge in a shirt pocket. Gates Corporation Kriket V-belt tension gauge part number 91107 or equal.

3.3 Tool Chest. The tool chest shall contain and organize the components listed in Table 1. The tool chest shall be constructed of any material that provides the performance described

below. The weight of the chest and its components shall not exceed 250 pounds when fully loaded. If more than one chest is required, the top and at least one side of each chest shall be conspicuously marked "X of Y", with X being the number of the chest in the set and Y being the total number of chests. Chests can be different heights, but they shall all have the same length and width. The chests shall be able to be stacked with each other. Components that are furnished in their own cases shall be placed in the chest in the case.

3.3.1 General exterior configuration. The chest shall be constructed with a base and a lid that shall be entirely separable. Multiple chests, if required, shall be similar in design and shall be stackable to no less than two high.

3.3.2 Hardware. All metal hardware on the chest shall be corrosion resistant stainless steel, and shall be able to withstand long term exposure under corrosive atmospheric conditions. Hardware that protrudes into the chest interior shall not present a hazard to users' hands. Rivets and screws that attach the hinges, handles and locking hasps shall not be removable with common tools, and resist removal from outside the chest when the lid is on and locked.

3.3.3 Handles. The chest shall have no fewer than two handles on each side of the lower half of the chest, totaling a minimum of eight handles. The handles shall be rated, as pairs, for not less than 1-1/2 times the weight of the fully loaded chest (375 pounds). Handles shall be affixed using mechanical fasteners, e.g. rivets or screws, which cannot be readily removed with common tools. In addition, four more handles shall be added to the lid to aid in removing the lid when opening the chest for access to the tools. These handles may be the same as the handles used on the lower half of the chest, or may be smaller if required for proper fit onto the lid. Each chest shall have a warning label prominently displayed on the exterior of the chest stating "Multiple person lift required." The weight of the chest shall be indicated on the outside of the chest.

3.3.4 Security. The chest shall include one or more locking feature(s) for the entire chest. If a single locking feature is used, it shall prevent opening or removing the lid when locked. The locking feature(s) shall not use a cable. If padlocks are used they shall conform to the requirements of Commercial Item Description A-A-59486 and shall be included. The chest shall also include a means to tether the chest to a post, or pillar, by means of a chain that can be run from chest to chest, through the handles, or other tethering devices, and then locked. Two keys shall be provided with each padlock. If the chest design is such that it is lockable with an internal lock, the keying and tumbler action shall also meet the requirements of CID A-A-59486. All locks in a single tool set shall be keyed alike, with two keys for each lock.

3.3.5 Finish. The exterior surface finish shall be clean and corrosion resistant and shall have no sharp edges or projections.

3.3.6 Color. The color of the chest shall be olive drab and the coloring agent shall be part of the base material such that no painting is required to maintain the color.

3.3.7 Pressure differential compensation. The chest shall be designed to compensate for differential pressures that may develop as a result of changes in temperature or in altitude.

3.3.8 Cold weather use. The tool chest shall be designed for storage and use in cold weather down to -25 degrees Fahrenheit (F) or colder.

3.3.9 Hot weather use. The tool chest shall be designed for storage in temperatures of no less than 175 degrees F and use in temperatures of no less than 120 degrees F.

3.3.10 Stack-ability and crush resistance. The fully loaded chest, when closed, latched, and in its normal resting position shall protect its contents from damage. It shall withstand, without damage or permanent deformation to itself, a load consisting of three other fully loaded tool chests stacked on top of it for one hour. After the removal of the top chests, the chest that was on the bottom shall retain its original shape.

3.3.11 Water repellence. When closed and locked, the chest shall repel water from a direct rain and the tools shall remain dry. It shall withstand blowing rain on all four sides with a minimum wind speed of 25 mph without water entering the chest.

3.3.12 Rough handling. At room temperature a fully loaded tool chest shall withstand being dropped 4 times from 60 inches to a concrete floor, each time landing on a different one of the four bottom edges. On the last drop it shall then be rolled over on its lid and back to the base. All this shall be accomplished without sustaining any permanent damage or degradation to its proper functioning, or the tools being damaged, becoming dislodged and moving freely around in the chest. After being dropped, the locking features and the tool chest shall operate properly without degradation of performance.

3.3.13 Impact resistance. When fully loaded, closed, latched and placed in its normal resting position in a room temperature environment, each type of tool box, shall withstand impacts from dropped objects. As a minimum they shall withstand an impact from a steel bar weighing at least 3 pounds, with a cross section no larger than 3/16 x 1 inch and with an edge radii no larger than 1/16 inch. This bar shall have been dropped in free fall from a height of 8 feet, and shall have landed narrow end down on the lid of the tool box. Each tool box shall absorb this blow without suffering permanent deformation to its general overall configuration.

3.3.14 Interior tool storage system. An interior tool storage system shall be provided that groups the tools in the chest so that tools can be immediately located, and allow withdrawing the tools from the chest without having to sort through the chest. The tool organizing method shall retain tools in position, provide for rapid inventory of the tool load, and maintain the position of the tools under rough handling and shipping conditions. Each single pocket or cutout that is intended to hold a tool or component shall be configured to hold the tool snugly and completely while allowing easy removal of the tool and shall include as necessary pick holes, cut out or recessed areas or protrusion of tools above the tool organizing method. Each contoured retention feature shall securely hold the tool in place so that when the tool chest is dropped, the tools will be retained in position. Each retention feature shall be smooth and free from rough edges. Finger pick relief shall be provided for tools that would otherwise be difficult to remove. If foam is used, it shall be closed cell and coated so that moisture is not retained in pores. If foam is used, it shall be closed-cell, no less than 6-pound density, and shall have a water absorption rate of no greater than 0.02 pounds/square foot over the cut surfaces when tested in accordance with ASTM

D3575. Each retention feature shall be smooth and free from rough edges. Webs between component storage locations shall provide rigidity and shall be resistant to tearing. If foam laminations are used, laminations shall be complete, essentially making one large piece of foam. The lamination method shall not allow the laminations to be readily separated, or pulled apart by hand. The organizing method shall provide contrasting color underneath the tools to aid in rapid inventory. The materials used in the tool organizing method, including trays or pallets, shall be resistant to water, refrigerants, automotive oils, greases, lubricants, fuels including gasoline, diesel fuel, JP-8 and JP-4, acids, bases, coolants, alcohols and cleaning agents. Wood or metal trays or pallets to support the organizing method shall not be used because they are not resistant to fluids listed above. Each group of tools in its system shall be layered inside the chest and each layer shall be provided handles as needed for two persons to lift each layer out of the chest. The combined weight of the lifted layer shall not exceed 73 pounds (two person lift). The use of rust inhibiting or moisture removal compounds is permitted, providing that the item is replaceable, able to be incorporated into the storage system, and does not cause deposits on the tools or chest. If items are on the bottom of the tool box/chest, for bulky items the object or tool can be removed individually. In some cases the weight of several items in the bottom may weigh more than the 73 pounds for the two man lift tray. In all chests the heavy tool should be placed in the bottom layer.

3.4 Industrial quality tools. All components supplied with this set shall be industrial quality. For the purposes of this procurement, the term “industrial quality tools” versus household-use tools or general purpose tools are defined as tools commercially marketed and manufactured for constant, rigorous, industrial or professional environment use. The items offered shall have either achieved industrial market acceptance (as defined below) or have been satisfactorily supplied to the Government under current or recent contracts for the same or similar requirements. Industrial quality tools are used primarily by skilled professionals and technicians in such areas as machine shops, automotive maintenance and repair facilities, aircraft maintenance and repair facilities, industrial automotive assembly plants, fleet maintenance facilities, and airline service facilities. The tools will be used for specialized applications in an environment of virtual constant use, (i.e. around-the-clock 8 hour shifts), with applications requiring high torque, low slippage, and strict tolerances.

3.5 Market acceptance. Market acceptance is demonstrated by the component having a higher percentage of sales to industrial/professional customers than to retail or government customers. Advertising or marketing literature that indicates “professional grade” or “industrial quality”, or merely stating that an item is “professional grade” or “industrial quality” is insufficient to establish industrial quality tools since these are terms for which there is no generally accepted definition. A claim that an item is manufactured to an industry consensus standard is also insufficient to establish industrial quality tools. The contracting officer may require offerors to provide evidence of market acceptance in the professional or industrial market. Evidence of acceptance by industrial/professional customers includes sales to fleet operators, distributors, contractors, industrial and professional users, and sales to distributors who retail exclusively to the professional or industrial market.

3.6 Warranty. All components shall be warranted with the warranty stated in Table 1. The offeror shall state the length and terms of the manufacturers’ warranties in response to the

solicitation. The warranties shall become part of the contract or delivery order. The contractor shall furnish a spreadsheet with the component numbers, nomenclature, quantity, manufacturer, country of origin, part number, unit price, and length of warranty for each component as stated in the Instructions to Offerors and the solicitation.

3.7 Markings. A diagram (consisting of photos or drawings) showing the location of each component in its loaded position shall be provided with each tool box and shall be permanently affixed to the inside of the lid. The manner in which the diagram is permanently affixed to the inside of the lid shall not inhibit the ability to open or close the container. This diagram shall serve as an inventory sheet to facilitate rapid inventory. The diagram shall be water and dust resistant and durable. In addition, warranty information concerning the tools and the tool box shall also be permanently affixed to the inside of the tool box. Warranty information shall include the length and terms of the warranty. A complete list of tools including the nomenclature, manufacturer's part number and NSN, when known, shall also be permanently affixed to the inside of the tool box. The diagram, tool list and warranty information may be combined into one document or may be provided separately.

3.7.1 Non-Warranty. For the non-warranty ordering of replacement tools from the contractor, the procedures as determined by the contractor (including phone number, web site and email address if they are applicable) may be provided separately or included with or near the above information.

3.7.2 Warranty Label. The toolbox shall have a warranty label that is permanently affixed to the inside of the lid of the tool box. The label shall be provided on a permanent, water resistant, scuff resistant label, which is permanently affixed to the inside of the lid of the tool box. For more information on this label, contact the contracting officer.

3.7.3 Identification Data Plate Information. A second placard shall also be attached inside the lid of the tool chest. The placard shall minimally contain a list of the contents of chest.

Nomenclature: Tool Kit, Refrigeration Service Accessory

Part Number: (SC to be assigned)

NSN: (To be assigned)

Net Weight: (To be assigned)

Cube: (To be assigned)

Contract Number: (To be assigned after award)

CAGE Code: (To be assigned after award)

Date Manufactured: (To be assigned after award)

4. VERIFICATION

4.1 General provisions. The inspections (demonstration and/or examination) herein shall be performed to determine whether the item conforms to Section 3 of this Description for Purchase.

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

- a. Preproduction verification inspection (see 4.2)
- b. Conformance inspection (see 4.3)

4.1.2 Inspection conditions. Unless otherwise specified in the contract or delivery order, all inspections shall be performed in accordance with the inspection conditions specified herein.

4.2 Preproduction verification inspection.

4.2.1 Submission. The contractor shall submit one or more kits for preproduction verification in accordance with the contract or delivery order.

4.2.2 Inspections to be performed. As determined by the Government, the product verification assemblies, components and test specimens may be subjected to any or all of the verification methods specified in paragraphs 4.4 and 4.5.

4.2.3 Rejection. If any test assemblies, test specimens or test components fail to comply with any of the applicable requirements, the product verification sample shall be rejected. The Government reserves the right to terminate inspection upon any failure of a test assembly, specimen or component to comply with any of the requirements.

4.3 Conformance inspection.

4.3.1 Compliance. Conformance inspection shall be applied to production units being offered for acceptance under the contract. These inspections shall include all verifications listed in paragraph 4.5 and be limited to the examination of product to verify compliance with design requirements established during product verification.

4.3.2 Inspection lot formation. Lot formation shall be in accordance with Section 4 of MIL-STD-1916.

4.3.3 Sampling plan determination. Conformance verification methods are specified in paragraphs 4.5. When required by contract or cited herein, attribute-sampling inspections shall be conducted in accordance with MIL-STD-1916 using Verification Level I.

4.3.4 Rejection. Failure of any unit to pass any verification shall be cause for rejection of the lot.

4.4 Product Performance Verification.

4.4.1 Exterior configuration. Verify the chest is constructed with a base and a lid that is entirely separable and does not utilize a hinge between the two. (see 3.3.1)

4.4.2 Hardware. Verify by manufactures data that all metal hardware on the chest is corrosion resistant and able to withstand long term exposure under corrosive atmospheric conditions. (see 3.3.2)

4.4.3 Handles. Verify the chest includes enough handles for six soldiers to lift the case – each using one hand – and to enable the loaded case to be pulled from an enclosed space whether loaded narrow side first or wide side first. Verify the handles are rated, as pairs, for not less than 250 pounds of weight. Verify the handles automatically fold against the side of the case when not in use. Verify while in use, the handles stop at a 90-degree angle to the face of the case. Verify the handles are affixed using mechanical fasteners that cannot be readily removed with common tools. (see 3.3.3)

4.4.4 Security. Verify the chest includes a locking feature for the entire chest that utilizes one or two padlocks. Verify the padlocks conform to the requirements of Commercial Item Description A-A-1927. Verify the chest includes a means to tether the chest to a post, or pillar, by means of a chain that can be run from chest to chest, through the handles, or other tethering devices, and then locked with a padlock(s). If the chest utilizes a tethering device, other than the handles, verify by analysis or demonstration the tethering feature will withstand a pull of no less than 250 pounds. (see 3.3.4)

4.4.5 Water repellence. A fully loaded tool chest, that is closed and locked, shall be placed in a water spray apparatus for a minimum of 5 minutes per side. The spray source shall beat directly and uniformly upon the chest. Rotate the chest to expose it to the spray source on all four sides of the chest. At the end of the period turn off the water and towel dry the exterior of the chest. Open the chest and inspect the inside for accumulation of water. The accumulation of water inside shall constitute failure of this test. (see 3.3.11)

4.4.6 Cold temperature resistance. The chest shall be fully loaded and stored for 3 hours in an environment no warmer than a cold temperature of -25°F. Within 5 minutes the chest shall then be removed from the cold temperature environment and be dropped from a height of 24 inches onto a hard floor surface. Verify all of the latches, locks and handles operate properly, without permanent deformation or breakage of the chest. (see 3.3.8)

4.4.7 Hot Temperature Resistance. The chest shall be fully loaded with all components and stored for 3 hours in a hot temperature environment of no less than 140 degrees F. The chest shall then be removed from the hot temperature environment and dropped from a height of no less than 60 inches onto a concrete floor. The chest shall then be rolled over on the floor, 360 degrees, four times, once over each lower edge. Verify the latches remained closed, there was no displacement of any of the retained tools and the chest did not sustain any permanent deformation or damage or of its handles. Failure of any of these verifications shall constitute failure of this requirement (see 3.3.9).

4.4.8 Stack-ability and crush resistance. Verify the chest is designed for stack ability by placing an unloaded chest on top of the lower chest. Verify the handles, clasps, or other features do not interfere with stacking. Verify the chest, when closed, latched, and in its normal resting position protects its contents from damage. An identically fully loaded chest shall be stacked on

top of the verification chest for one hour. Verify that after the removal of the top chest, the bottom verification chest, retained its original shape without damage or permanent deformation to itself. (see 3.3.10)

4.4.9 Ambient temperature rough handling. A fully loaded tool chest, conditioned to room temperature, shall be dropped 4 times from a height of 60 inches onto a hard floor and rolled over. Each drop shall be a landing on a different one of the four bottom edges. Verify after each drop all of the latches, locks and handles operate properly, without permanent deformation or breakage of the chest. (see 3.5.1) Verify the tools are not damaged, dislodged or moving freely around in the chest. (see 3.3.12)

4.4.10 Impact resistance. A fully loaded tool chest shall be inspected for resistance to damage from impacts of sharp falling objects. A steel bar weighing a minimum of 3.0 pounds, with a cross section no larger than 3/16 x 1 inch and with an edge radii no larger than 1/16 inch shall be dropped in free fall from a height of a minimum of 8 feet. The bar shall land narrow end down on the lid of the tool chest. Verify the chest absorbed this blow without suffering permanent deformation to its general overall configuration. Verify the impact did not cause penetration of the lid by the steel bar. (see 3.3.13)

4.4.11 Color. Verify the color of the chest is olive drab and the coloring agent is part of the base material. (see 3.3.6)

4.4.12 Pressure differential compensation. Verify the chest is equipped with a compensation device (pressure relief valve) or equivalent method that compensates for differential pressures of changes in temperature or in altitude. (see 3.3.7)

4.4.13 Interior tool storage system. Verify the tools in the chest can immediately be located and withdrawn from the chest without having to sort through the other tools in the process. Verify the components indicated in Table 1, except Item 10, are assembled into organized stacked layers that are inside the tool chest with cut outs for each individual tool. Verify the tool organizing liners fill the chest to prevent as much movement as possible. Verify each organizing liner has a rigid bottom strong enough to hold the tools positioned within the layer as well as handles, ties, ropes, or some other device to aid in the removal of each layer. Verify each retention feature is smooth and free from rough edges. (see 3.3.14)

4.5 Product conformance inspection. Verify by objective evidence that material, processes, and configuration are consistent with those during product verification.

4.5.1 Finish. Verify the chests exterior finish is clean and corrosion resistant. Verify there are no sharp edges or protrusions on the exterior of the tool chest. (see 3.3.5)

4.5.2 Warning markings. Confirm that each tool kit has prominently displayed a warning label stating the number of person lift as required. (see 3.7)

4.5.3 Components. Verify that if any of the suggested manufactures' part numbers listed in Table 1 are not used that an equivalent component is provided that is of industrial quality and has the same or better form, fit, function, quality, and warranty as the listed item or part number. (see 3.2)

4.5.4 Industrial quality tools. When required, verify that tools provided conform to industrial quality standards through substantial evidence of sales to industrial customers. (see 3.4)

4.5.5 Warranty. Verify that all components, as indicated in Table 1, are warranted in accordance with manufacturing requirements as specified and all warranty literature is included. (see 3.6)

4.5.6 Quantities. Verify the tool quantities listed in Table 1 are provided in each kit. (see 3.2)

4.5.7 Packaging. Verify that unit packaging, unit package markings, shipping containers, shipping container markings, packing lists, quality certification heat treatment markings and unitization requirements are in accordance with Section 5 of this DFP. Failure to comply with the requirements may be cause for rejection.

4.6 Changes to materials, processes, or configuration. The contracting officer shall be informed of any changes to the materials, processes, configuration or other characteristic of the units. The contracting officer shall determine if the reported changes to items shall require the verifications of paragraph 4.5 to be repeated.

4.7 Conformance of subsequent production quantity. All products offered for acceptance throughout the life of the contract shall conform to all of the requirements of the contract. The Government reserves the right to re-verify conformance with requirements, at its own facility and at its own expense, at any time during the life of the contract and return to the contractor for warranty replacement such product that does not conform to the specified requirements.

5. PACKAGING

5.1 Packaging. The packaging requirements shall be as specified in the contract or delivery order.