

INCH-POUND

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SUPERSEDING

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COMMERCIAL ITEM DESCRIPTION**SPRAYING UNIT, CLEANING-DEICING- ANTI-ICING FLUID, TRUCK MOUNTED**

The General Services Administration has authorized the use
of this commercial item description by all federal agencies.

1. **SCOPE.** This commercial item description (CID) describes chassis mounted, diesel powered, spraying units, which are capable of deicing, anti-icing, cleaning, and decontaminating the entire range of airframes in the U. S. Air Force's inventory. Two general classifications are herein defined: first, a basic unit that can de/anti-ice and clean all but the upper tail sections of C-5 and C-17 airframes; and, second, a spraying unit provided with the extended reach necessary to effectively de/anti-ice C-5 and C-17 horizontal stabilizers. Both types of spraying units include boom-mounted enclosed cabs from which de/anti-icing and decontamination operations are performed. The spraying units are capable of the controlled application of heated deicing fluid, forced air, deicing fluid injecting into the forced-air stream, and unheated anti-icing fluid. An auxiliary engine is provided to hydraulically operate all de-icing components including: boom and enclosed cab actuation, deicing-fluid heater motor and fuel pump, forced-air compressor, and separate deicing and anti-icing pump motors.

2. **CLASSIFICATION.** The two types of spraying units covered by this CID are classified as follows:

<i>Class</i>	<i>Elevation of Boom</i>	<i>Minimum Tank Capacity</i>
A	42 feet	1,800 gal
B	75 feet	2,800 gal

3. **SALIENT CHARACTERISTICS.**

3.1 **General.** Both Class A and Class B spraying units shall be constructed in accordance with the requirements of SAE ARP 1247C, "General Requirements for Aerospace Ground Support Equipment, Motorized and Nonmotorized," SAE ARP 1971A, "Aircraft Deicing Vehicle – Self-Propelled, Large Capacity," and this document. In the event of a conflict between either ARP 1247C or ARP 1971A and the text of this document, this document shall take precedence. Nothing in this document, however, overrides applicable laws and regulations, unless specific exception has been obtained by the procuring agency. Unless otherwise specified, each of the following salient characteristics shall be applicable to both Class A and Class B spraying units.

The spraying unit shall be designed for two-person operation. It shall be maintainable with standard tools and built with modular parts supplied from commercial sources.

3.1.1 **Modified commercial product.** The spraying unit at a minimum shall be the manufacturer's standard commercial product modified as necessary to be in accordance with the requirements specified herein. Additional or better features which are not specifically prohibited by these specifications, but which are part of the manufacturer's standard product, shall be included in the unit being furnished.

Beneficial comments, recommendations, additions, deletions, clarifications, etc. and any other data that may improve this document should be sent to: 642 CBSG/GBEC, 460 Richard Ray Blvd Ste.200, Robins AFB, GA 31098-1813.

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3.2 Components: The spraying unit shall consist of the following major components:

<i>Item or System Name</i>	<i>See Characteristic</i>
Chassis	3.6
Truck cab	3.7
Unit frame	3.8
Boom assembly	3.9
Stabilizers	3.10
Enclosed cab	3.11
Auxiliary engine	3.12
Hydraulic system	3.13
Plumbing	3.14
Pumping systems	3.15
Fluid heating system	3.16
Fluid tanks	3.17
Delivery system	3.18

3.3 Design and construction. The spraying unit shall be designed for easy operation with limited and conveniently placed controls and operational components. All components of the unit shall be arranged for maximum ease of operation and maintenance (see 3.3.2). The controls shall be readily operable by personnel wearing heavy, arctic gloves and clothing. Welding and welding qualifications shall be in accordance with AWS D1.1, D1.2, and SAE ARP 1330B. The spraying unit shall meet the following electromagnetic interference emissions and susceptibility requirements of MIL-STD-461F as applicable: CE102, CE106, CS103, CS104, CS105, CS114, CS115, CS116, RE102, RE103, and RS103. The stability of the unit shall conform to SAE ARP 1328A, "Aircraft Ground Support Equipment Vehicle Wind Stability Analysis." The spraying unit sound levels shall conform to the recommended practice indicated in SAE J 1096.

3.3.1 Service life. The spraying unit shall be designed to have a minimum service life of twelve years.

3.3.2 Maintainability. The spraying unit shall be designed and constructed as follows:

- a. There shall be a minimum number of parts consistent with reliability and performance specified herein.
- b. All de/anti-icing and decontamination components shall be readily accessible, either by hinged compartment doors or removable panels, which shall not require more than five (5) minutes to open or remove.
- c. The spraying unit shall allow adjustments, servicing, maintenance, and replacement of parts and components with minimum disturbance to other equipment, parts, or components. Parts and components shall be positioned for access and ample working space shall be provided, unless performance or reliability is appreciably degraded by the access location. In performing maintenance, if engineering reasoning or data determines that physical or visual interference between items cannot be avoided, the item predicted to require the most maintenance shall be provided primary access.
- d. Routine maintenance shall be accomplished with common hand tools and equipment available commercially. Special purpose tools and equipment shall be identified. Provision of special purpose tools and equipment shall be subject to approval by the procuring agency.
- e. The number of tools required to accomplish maintenance shall be minimized by applying design practices such as reducing the variety of bolt head sizes.
- f. Where possible, all wiring shall be incorporated into harnesses and replaceable within 30 minutes.

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3.3.3 Part numbering and interchangeability of parts. All parts having the same manufacturer's part number shall be functionally and dimensionally interchangeable. The item identification and part number requirements of ATA 101 shall govern manufacturer's part numbers and changes thereto.

3.3.4 Air transportability. The spraying unit shall be air transportable within C-5 and C-17 cargo aircraft. MIL-HDBK-1791 and MIL-STD-1366 shall be used as references. Additional information will be provided by the procuring agency upon request.

3.4 Performance. The spraying unit shall be capable of providing full deicing and anti-icing operations under the following conditions without detrimental effect to subsequent operation:

- a. Ambient temperatures ranging from -40° F to 130° F.
- b. Elevations up to 6,000 feet above sea level.
- c. A relative humidity of at least 100 percent at an operating temperature of 130° F.
- d. All forms of precipitation encountered during field operation.
- e. Vibrations encountered during shipment and road operation.
- f. Wind loads of at least seven (7) pounds per square foot.
- g. Continuous 25 miles per hour (mph) operating speed on horizontally level surfaces with fluid tanks full in accordance with 3.2.2 of SAE ARP 1971A.
- h. Continuous 4 miles per hour operating speed when boom of Class A spraying unit is not cradled or when boom of Class B spraying unit is not cradled and outriggers/stabilizers are not deployed.

3.5 Safety. In addition to the safety requirements specified in 3.8, 3.9, and 3.10 of SAE ARP 1247C the following safety features shall be included:

- a. Emergency shutdown control switches shall be provided in the enclosed cab, truck cab control panel, and by the ground control station to shut down the auxiliary engine fluid and heating system as well as stop all boom movement. The communication system (see 3.11.1) shall not be interrupted by the activation of this switch.
- b. Automatic shutdown of pumps in the event of low fluid level.
- c. A fire extinguisher system, which includes a mechanism that shuts down the fluid heater upon activation. The system being installed must be certified by the manufacturer for its intended use. The system shall be automatically activated as well as manually operated, as per 3.9.9 of SAE ARP 1971A.
- d. Shutdown devices with manual reset switches in the event of overheating or misfiring of the fluid heater.
- e. Automatic 45-second fresh air purge of heater before ignition and manual 150-second fresh air post-purge after heater shut down.
- f. Interlock system to prevent driver from operating in excess of 4 mph while the boom is in raised, out of boom rest or cradle, position.
- g. Means of regaining control of the enclosed cab and boom from ground level in the event of disabling accident or injury to operator in the enclosed cabin by way of a 12-volt (DC) emergency hydraulic pump.
- h. Redundant proximity switches shall be provided that identify maximum boom extension and when stabilizers are required in the lower envelope (Class B only).
- i. Redundant proximity switches shall be provided that identify minimum boom angle in the upper envelope (Class B only).

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- j. Audible backup warning alarm.
- k. Audible stabilizer deployment alarm (Class B only), which may be the same as the back alarm. This alarm should be located at ground level to be heard by personnel in close proximity.
- l. A red flasher, meeting minimum aviation requirements, shall be installed on the rotator assembly at the highest and most visible point. A flasher control switch shall be located on the truck cab control panel.
- m. Warning decals, as appropriate.

3.6 Chassis. A commercial or custom truck chassis in accordance with section 3.3 of SAE ARP 1971A, which has been modified to satisfy the requirements of either a Class A or Class B spraying unit configuration, shall be provided. The chassis shall interface with the unit frame, boom assembly, and all other components in such a manner that the entire assembly exists as an integrated whole.

3.6.1 Diesel engine. The spraying unit shall be diesel engine driven. It shall be in accordance with SAE ARP 1052A.

3.6.2 Winterization. A winterization package, consisting of heaters for engine coolant, oil pan, and transmission, as well as battery warmers shall be provided for operation for lower range temperatures down to -40° F. The winterization system shall be designed to operate from an external 220-volt AC power source. A 25-foot cable shall be provided. A visible or audible warning device shall notify the driver if the truck remains connected to the cable when the truck engine is started.

3.6.3 Cooling system. The cooling system shall withstand ambient temperatures between -40° F and +125° and 100% relative humidity.

3.6.4 Alternator. At engine idle the alternator shall supply 110 percent of the maximum electrical steady load imposed at engine idle.

3.6.5 Transmission. The driveline shall include an automatic transmission. The net torque capacity and the net power rating of the transmission shall exceed the output ratings of the engine.

3.6.6 Steering. The spraying unit shall be equipped with power steering.

3.6.7 Brakes. The spraying unit shall be equipped with air brakes or split dual hydraulic brakes.

3.6.8 Suspension system. A torsion bar style suspension system shall be included.

3.6.9 Tire tread. Tires shall be of all-season radial design.

3.6.10 Tow Hooks. Tow hooks shall be installed on the chassis frame, or on suitable members attached directly to the chassis. There shall be two located in both, the front and rear, one on each side of the centerline.

3.7 Truck cab. The chassis shall include a standard truck cab with seating for vehicle driver and one passenger. The driver's position shall be on the left side of the chassis to provide the maximum possible view of the enclosed cab operator and enclosed cab under all operating conditions.

3.7.1 Truck cab control panel. In addition to the standard instrument panel provided by the chassis manufacturer, a separate control panel for deicing operations shall be provided that includes the following:

- a. Auxiliary engine controls (see 3.12.1).
- b. Fluid pump on/off switch(es).

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- c. Heater on/off switch and activation indicator light.
- d. Flashing (red) beacon on/off switch.
- e. Emergency stop switch (see 3.5-a.) and activation indicator light.
- f. Overhead window washer/wiper activation switch.
- g. Gauge lights for nighttime operation.
- h. Deicing & anti-icing fluid level gauges.
- i. Deicing fluid pressure gauge.
- j. Deicing fluid temperature gauge.

3.7.2 Truck cab observation window. The cab roof shall be fitted with a large, sloped observation window. An electric wiper for overhead viewing from either the driver or passenger's seated position shall be included.

3.7.3 Truck cab boom controls. In addition to the enclosed cab boom controls (see 3.11.2), identical boom actuation and cab rotation fully proportional joystick controls shall be installed between the driver and passenger, so that either may conveniently operate them. In accordance with 3.4.8 of SAE ARP 1971, these controls shall override the enclosed cab controls. These controls shall not operate when the boom is in the upper operational envelope, between 42 feet and 75 feet of elevation, of the Class B spraying unit.

3.8 Unit frame. All components of the deicing unit, including fluid tanks, auxiliary engine, heater, fluid pumps, and boom pedestal shall be mounted on a frame that fastens to the truck chassis. This framework shall be designed to allow for mounting on any chassis that conforms to the manufacturer's requirements and containing all the relevant modifications for either a Class A or Class B configuration.

3.9 Boom assembly. The boom assembly or aerial device shall be in accordance with ANSI A92.2. It shall be specifically designed to achieve the maximum in maneuverability, stability, and safety for de/anti-icing operations within the specified range of either the Class A or Class B spraying unit. Under all operating conditions, the boom shall operate smoothly. The boom shall rotate 360 degrees, non-continuously in accordance with 3.4.3 of SAE ARP 1971.

3.9.1 Boom stability – Class A. The boom assembly shall be designed to support a working load of 350 pounds in the enclosed cab during mobile operations or while in any extended position. With a 700-pound load placed in the enclosed cab with the boom assembly in any extended position, with no fluid in the de/anti-icing fluid tanks, the deicing unit on level ground shall be capable of remaining stable and not overturn.

3.9.2 Boom stability – Class B. The boom assembly shall be designed to support a working load of 250 pounds in the enclosed cab during mobile operations or while in any extended position. With a 500-pound load placed in the enclosed cab with the boom assembly in any extended position, with no fluid in the de/anti-icing fluid tanks, the deicing unit on level ground shall be capable of remaining stable and not overturn.

3.9.3 Range of platform movement – Class A. The boom assembly of the Class A spraying unit shall raise the enclosed cab to a minimum vertical height of 42 feet as measured from level ground to the floor of the enclosed cab. The boom assembly shall also have a horizontal, side reach of not less than 40 feet as measured from the fluid spray nozzle to the centerline of the turntable.

3.9.4 Range of platform movement – Class B. In addition to the range of platform movement for a Class A spraying unit, as specified in 3.9.1, the boom assembly of the Class B spraying unit shall raise the enclosed cab to a minimum vertical height of 75 feet as measured from the level ground to the floor of the

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enclosed cab. The boom assembly shall also have a horizontal, side reach of not less than 40 feet as measured from the fluid spray nozzle to the centerline of the turntable.

3.9.5 Operational envelope/limit indicators – Class B. Situated near or within view of any set of boom controls, the Class B spraying unit shall be equipped with a light panel that indicates via proximity sensors whether the enclosed cab is in the lower (below 42 feet) operational envelope or the upper (42 feet or above) operational envelope. Each light panel, along with audible warning, shall also provide indication when the boom has reached or is in proximity to any of its operational limits, such as maximum/minimum angle, maximum extension, and the full extent of the lower envelope, signifying that stabilizer deployment is required for further extension. This system shall only allow the boom to operate in stable configurations. All audible warnings shall be clearly heard in both the enclosed and truck cabs under all operating conditions.

3.9.6 Boom controls. In addition to the enclosed cab (see 3.11.2) and truck cab (see 3.7.3) controls, hydraulic boom controls shall be provided at a ground level control station. The ground level boom controls shall be fully proportional and shall extend/retract and rotate horizontally/vertically the boom. These ground level controls shall override either the enclosed cab or truck cab boom controls.

3.10 Stabilizers. If the Class B deicing unit is equipped with outriggers or stabilizers, the unit shall be in accordance with 3.10.9 of SAE ARP 1247C, which shall be engaged whenever the enclosed cab is in the upper operational envelope, from 42 feet to 75 feet in elevation. Electric over hydraulic controls for the outriggers or stabilizers shall include the following interlocked features to assure safe operation:

- a. Before the stabilizers can be deployed the truck transmission shall be in neutral and the parking brake set.
- b. Before the boom can be extended into the upper operational envelope (above 42 feet), the stabilizers shall be fully deployed.
- c. Before the stabilizers can be retracted the boom shall be in the lower envelope.
- d. Before the truck transmission can be placed in gear the stabilizers shall be completely stowed. Means to override this interlock shall be provided, for emergency situations when the truck needs to be driven and completely stowing the stabilizers is not possible.
- e. Cross-port check valves shall be installed to prevent hydraulic drift of each stabilizer.

3.11 Enclosed cab. An enclosed cabin along the middle to upper portion of the boom assembly shall be provided, in full accordance with SAE ARP 5058, "Enclosed Operator's Cabin for Aircraft Ground Deicing Equipment." The enclosed cab shall have sufficient room for one operator. Means to automatically level the enclosed cab, while the boom is anywhere within its operational range, shall be included. The enclosed cab shall be capable of horizontal rotation of a minimum of 45 degrees in either direction from straightforward in the plane of the boom. All parts of the enclosed cab that may come in contact with the aircraft under normal operation shall be padded with a resilient, replaceable bumper.

3.11.1 Communication system. In addition to the two-way headset communication system provided in accordance with 3.3.9 of SAE ARP 5058 and 3.4.17 of SAE ARP 1971, means for a truck cab passenger, the truck driver, and enclosed cab operator to communicate simultaneously shall be provided. The system shall be powered with the on/off/start switch of the truck chassis.

3.11.2 Enclosed cab controls. Easily operated, readily accessible, and consolidated controls for boom-actuation, cab rotation, de/anti-icing fluid operations, and forced air operations shall be provided inside the enclosed cab. Controls shall be fully proportional, electric over hydraulic, and in accordance with 3.3.5 of SAE ARP 5058 and 3.10.6 of SAE ARP 1247C, of the "dead-man" type. Variable deicing fluid flow shall be controllable, while non-variable anti-icing flow, to protect the fluid from degradation, is recommended. Controls for wipers, washers, emergency stop, and emergency hydraulics shall be conveniently located.

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3.12 Auxiliary engine. A diesel engine, in accordance with SAE ARP 1052A, "Selection Criteria for Internal Combustion Engines Used in Ground Support Equipment," shall be capable of efficiently driving all de/anti-icing, cleaning, and decontamination components of the spraying unit. The engine capacity shall be such that the continuous duty horsepower input required by all engine-driven items shall not exceed 75 percent of the full throttle rating of the engine, at sea level and 59° F. The engine shall have a minimum of four cylinders.

3.12.1 Auxiliary engine controls. All auxiliary engine controls shall be mounted on the truck cab control panel. Auxiliary engine controls, indicators, and gauges shall include: off/on/start switch, fuel level gauge, tachometer, oil pressure gauge, water temperature gauge, battery charge indicator gauge, and hour meter.

3.12.2 Auxiliary engine exhaust. The auxiliary engine exhaust shall be routed and properly guarded so as to eliminate any possibility of danger to personnel, components, and wiring. The exhaust shall terminate at the rear of the spraying unit no less than 95 inches above the ground, and shall be equipped with spark-arresting muffler.

3.12.3 Auxiliary Engine Fuel Tank. In addition to the standard truck chassis fuel tank a separate fuel tank with a minimum capacity of 150 gallons shall be provided. The fuel system shall be capable of operating the auxiliary engine and heater at rated output for a minimum of four hours without refueling. The fuel system shall be designed to provide for shutdown of the heater first, auxiliary engine second and chassis engine last. The chassis fuel tank and the 150 gallon fuel tank will be connected together to provide additional capacity.

3.13 Hydraulic system. A complete hydraulic system capable of driving all the specific functions stated within this document shall be provided. All hoses, hose fitting tubes, tube fittings and flare for tubing shall be in accordance with SAE J512, J514, J516, J517, and J533. The system shall be filled with the proper amount of hydraulic fluid. The system shall be equipped with a hydraulic oil cooler and thermostatically controlled fan to maintain the hydraulic oil at the appropriate temperature to ensure proper operation of the unit within the operation envelope specified within this document. A low-level shutdown system shall be provided to protect the hydraulic system. The hydraulic oil reservoir shall be equipped with an externally mounted level and temperature gauge.

3.13.1 Hydraulic pressure test system. Test ports with quick disconnects shall be provided, along with an hydraulic test gauge, to allow a mechanic to quickly test for correct pressure in the various hydraulic circuits.

3.13.2 Electric-driven emergency hydraulic system. An emergency hydraulic system, driven from the 12-Volt DC battery, shall be provided. This system shall enable the aerial device to be maneuvered and lowered in the event of auxiliary engine failure.

3.14 Plumbing. The de/anti-icing system shall be designed to be compatible with all types of propylene glycol based deicing and anti-icing fluids, as well as, cleaning compound solutions conforming to MIL-PRF-87937. Plumbing hard lines and fittings shall be non-corrosive and wherever possible stainless steel.

3.15 Pumping systems. Two independently plumbed pumping systems shall be provided to drive heated deicing fluid and unheated anti-icing fluid to the delivery system.

3.15.1 Deicing fluid pump. A pump shall be provided for the delivery of deicing fluid from the deicing fluid tank, through the heater, and to either the spray nozzle of the enclosed cab or the ground hand nozzle on the front bumper of the chassis. The pump shall be capable of delivering heated deicing fluid from the enclosed-cab nozzle at the minimum flow rate (40 gallons per minute) and pressure (100 pounds per square inch) in accordance with 3.2.4 of SAE ARP 1971.

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3.15.2 Anti-icing fluid pump. A pump which will minimize degradation to the anti-icing fluid shall be provided. The pump shall be capable of delivering unheated anti-icing fluid to the spray nozzle of the enclosed cab at a flow rate of 20 gallons per minute and a pressure of 50 pounds per square inch. Pump shall shut off when spray nozzle is closed to further ensure limited degradation of the anti-icing fluid.

3.15.3 Fluid refill system. The anti-icing fluid pump system shall include the means to reverse flow, so that the anti-icing fluid tank may be filled from 55-gallon drums with the anti-icing fluid pump providing the necessary suction. The same such system shall be made available when specified for refilling deicing fluid tanks. The systems shall refill the fluid tanks at a minimum rate of 18 gallons per minute.

3.16 Fluid heating system. A heater that operates on either diesel fuel, Jet A or JP-8 shall be provided to heat deicing fluid. It shall have fully automatic ignition and controls for smokeless operation under all conditions, including starting and shut down. The fluid heater system shall have a minimum output heat capacity of 3,000,000 Btu per hour and shall provide maximum nozzle temperature in less than five (5) minutes when the fluid temperature starts at 50° F. It shall be equipped with a thermostat that maintains a fluid temperature of 185° F, plus or minus 10° F, and an automatic shut down that shall activate when the fluid reaches an excessive temperature.

3.16.1 Heater ignition. The heater ignition shall operate at temperatures as low as -40° F. It shall be in accordance with NFPA 70 and ignition cables within the system shall be in accordance with UL 558.

3.16.2 Combustion air blower. A combustion air blower, powered by the auxiliary engine pump, shall be provided as an integral part of the heater system. This blower, which shall automatically adjust in speed in response to the heater output requirements, shall provide the proper amount of air for fuel/air mixture.

3.16.3 Heater exhaust. The heater exhaust shall be directed up and to the rear of the unit. The exhaust outlet shall be protected from precipitation. It shall terminate no less than 95 inches vertically from the ground. The gas duct shall not be constructed of flexible metal tubing.

3.16.4 Heater Control. Electrical controls shall be centrally located at a heater control panel, with the exception of the thermal switches that may be located on the heating unit and the controls mentioned in section 3.7.1 of this document. The heater control panel shall include a method of displaying fluid inlet and outlet temperature, fuel pressure, combustion air pressure, and fluid flow. These parameters shall be capable of being monitored when the heater is idling or in operation.

3.16.5 Heater safety. The following safety features shall be incorporated into the heating system:

- a. The ignition system shall prevent discharge of fuel until proper ignition is assured.
- b. The heater during operation shall not be adversely affected by vibration, sudden shock, or tilted operation.
- c. The heater shall include a flow control switch to shut off fuel flow to the burner when there is no fluid flow through the heater.
- d. A safety valve shall automatically relieve pressure in the heater coil when the normal operating pressure is precariously exceeded.
- e. The heater shall shut down when exhaust temperatures are excessive.
- f. The Heater shall meet PONYA and MASSPORT requirements.

3.17 Fluid tanks. De/anti-icing fluid tanks shall be durably constructed of stainless steel. While the tanks may be of integrated construction, the deicing tank and anti-icing tank shall be physically and thermally isolated. The tanks shall be vented to allow for expansion and shall have internal perforated baffles to prevent fluid impact or sloshing during movement or rapid stopping. They shall also have sufficient-size openings to allow access to a mechanic performing repairs or maintenance. The tanks shall be equipped

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with a sump and holes for intake and return lines. The deicing fluid tank shall also be equipped with a strainer.

3.17.1 Fluid tank capacity – Class A. For Class A spraying units, the total fluid capacity shall be a minimum of 1,800 gallons, in accordance with 3.2.5 of SAE ARP 1971. The deicing fluid tank of the Class A unit shall have a minimum fluid capacity of 1,635 gallons and the anti-icing fluid tank shall have a minimum fluid capacity of 165 gallons.

3.17.2 Fluid tank capacity – Class B. For Class B spraying units, the total fluid capacity shall be a minimum of 2,800 gallons. The deicing fluid tank shall have a minimum capacity of 2,450 gallons, while the anti-icing fluid tank shall have a minimum capacity of 350 gallons.

3.17.3 Tank-level indicators. Level gauges in the truck cab and level sight gauges on the outside of the spraying unit shall be provided. The truck cab also shall be provided with an indicator that registers when the deicing tank is at such a low level that the deicing system has shut down to prevent damage to the deicing pump.

3.17.4 Tank drain handles. Drain handles shall be located to the side of the spraying unit to allow for easy opening and closing of tank drain valves.

3.18 Delivery system. Operation of the delivery system, consisting of the de/anti-icing fluid spray nozzle, forced air system, and ground handline system shall be independent and not be contingent upon operation of the heater or the boom. All components of the delivery system shall withstand the working pressures specified and a hydrostatic pressure of at least twice the specified working pressure without leakage or failure.

3.18.1 De/anti-icing fluid spray nozzle. A dual fluid spray nozzle shall be capable of variably delivering deicing fluid up to a minimum of 40 gallons per minute with the boom fully elevated. The nozzle shall also be capable of delivering anti-icing fluid up to a minimum of 20 gallons per minute without fluid degradation with the boom fully elevated. Various spray patterns shall be able to be selected from the controls. The spray patterns shall include a wide spread fine mist, a heavy conical spray, and a solid straight stream.

3.18.2 Forced air system.

3.18.2.1 Forced air nozzle. A separate nozzle to provide forced air, piped from the air compressor shall be provided. The air shall be delivered from the nozzle at a volumetric flow rate of no less than 1340 cubic feet per minute and at a velocity of 700 miles per hour. The pressure of the air emitted at the nozzle shall not be in excess of 13 pounds per square inch.

3.18.2.2 Forced air system. System shall be manufactured such that it is capable of continuously supplying air to the forced air nozzle. The air outlet shall be such that it will prevent the ingestion or discharge of internal components or damaging fragments in the event of a catastrophic failure of the system.

3.18.2.2.1 Air system meter. An hour-meter shall be provided to allow for monitoring the hours the blower has been in operation.

3.18.2.3 Deicing fluid injection. The system shall include means to inject deicing fluid into the air stream. The injected fluid shall have a flow rate of no more than 10 gallons per minute.

3.18.3 Control and range of nozzle motion. A control system within the enclosed cab shall remotely control both the de/anti-icing fluid and forced air nozzles, which may be joined together and move in unison. Both nozzles shall have a minimum horizontal range of movement of 45 degrees to the right and left of the straight-ahead position. The vertical range of movement shall be 90 degrees up, and a minimum of 45 degrees down from the horizontal position. The nozzles shall operate at a minimum speed of 5 degrees of arc per second.

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3.18.4 Ground handline system. An electrically powered hose reel shall be mounted to the unit for storing a 50-foot ground delivery hose on the class A unit and 100-foot on the class B unit. A shut off and drain valve shall be provided to permit draining and removal of the hose reel without interfering with operation of the rest of the system. The rewind switch shall be adjacent to the hose reel and protected from interference with the hose. The reel should also be equipped with a manual rewind hand crank and brake.

3.18.5 Fluid usage meter. The spraying unit shall be equipped with a fluid usage meter, which can be used to store volumetric history. A display shall be installed in full view of the enclosed cab operator. This display shall be clearly visible under all operating conditions.

3.19 Painting, plating, and corrosion

3.19.1 Color and finish. Exterior surfaces shall be prepared, primed, and painted with poly-urethane paint. The standard paint shall be resistant to aircraft hydraulic fluid (i.e. Skydrol). The color shall be Forest Green, color number 24052, of FED-STD-595, unless otherwise specified in the contract (see 7.2-a).

3.19.2 Dissimilar metals. Dissimilar metals, as defined in MIL-STD-889, shall not be in contact with each other. Metal plating or metal spraying of metals of dissimilar base to provide eletromotively compatible abutting surfaces shall be permitted. The use of dissimilar metals separated by suitable insulating material shall be permitted.

3.20 Markings. As a minimum, the national stock number (NSN), manufacturer, model number, serial number, contract number, registration number, date of delivery, and gross vehicle weight shall be permanently marked on a data plate mounted to the spraying unit chassis in a conspicuous location. Equipment, assemblies, and parts shall be marked for easy identification and correlation with the provided commercial manuals and parts lists.

3.21 Workmanship. The vehicle, including all parts and accessories, shall be fabricated in a thoroughly professional high quality workmanlike manner. Particular attention shall be given to freedom from blemishes, burrs, defects, and sharp edges; accuracy of dimensions, radii of fillets, and marking of parts and assemblies; thoroughness of welding, brazing, soldering, riveting, and painting; alignment of parts; tightness of fasteners; et cetera. The vehicle shall be thoroughly cleaned of all foreign matter.

4. REGULATORY REQUIREMENTS.

4.1 The offeror/contractor is encouraged to use recovered materials to the maximum extent practicable, in accordance with paragraph 23.403 of the Federal Acquisition Regulations (FAR).

5. PRODUCT CONFORMANCE.

5.1 Product conformance. The products provided shall meet the salient characteristics of this CID, conform to the producer's own drawings, specifications, standards, and quality assurance practices or as required in the contract, and shall be the same spraying unit offered for sale in the commercial marketplace, except where modified to be in accordance with the requirements specified herein. The government reserves the right to require proof of such conformance prior to first delivery and thereafter as needed.

5.2 Commercial item requirement. The vehicle furnished shall comply with the "commercial item" definition of FAR 2.101 as of the date of award. The government reserves the right to require the offeror/contractor to prove that their product complies with the referenced commerciality requirements and each salient characteristic of this document.

The offeror/contractor shall provide an itemized technical proposal that describes how the proposed model complies with each salient characteristic of this document; a paragraph by paragraph response to

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the salient characteristics section of this document shall be provided. The offeror/contractor shall provide two copies of their commercial descriptive catalogs with their offer as supporting reference to the itemized technical proposal. The offeror/contractor shall identify all modifications to their commercial model in order to comply with the requirements herein.

5.3 Inspection requirements.

5.3.1 General inspection requirements. Product sample(s) are required for examination and testing, to determine whether the spraying unit meets the requirements of this document, provides accurate and repeatable measurements, and has acceptable form, fit, function, and suitability for use. Apparatus used in conjunction with the inspections specified herein shall be laboratory precision type, calibrated at proper intervals to ensure laboratory accuracy.

5.3.2 Test rejection criteria. Throughout all examinations and tests specified herein, the product sample(s) shall be closely observed for the following conditions, which shall be cause for rejection:

- a. Failure to conform to design or performance requirements specified herein or in the contractor's technical proposal.
- b. Any spillage or leakage of any liquid, including fuel, coolant, lubricant, or hydraulic fluid, under any condition, except as allowed herein.
- c. Degradation of anti-icing fluid.
- d. Structural failure of any component, including permanent deformation, or evidence of impending failure.
- e. Evidence of excessive wear.
- f. Interference between the vehicle components or between the vehicle, the ground, and all required obstacles, with the exception of normal contact by the tires.
- g. Misalignment of components.
- h. Evidence of undesirable road-ability characteristics, including instability in handling during cornering, braking, and while traversing all required terrain.
- i. Conditions that present a safety hazard to personnel during operation, servicing, or maintenance.
- j. Overheating of the engine, transmission, or any other vehicle component.
- k. Evidence of corrosion.

5.3.3 Detailed inspection requirements.

5.3.3.1 Examination of product. The product sample(s) shall be examined to verify compliance with the salient characteristics herein. A contractor-generated checklist that identifies each relevant requirement and the inspection results shall be used. 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 sample's functions shall be verified. Each production vehicle shall be inspected to a reduced version of the checklist that has been approved by the procuring agency.

5.3.3.2 Road tests. The product sample(s) shall be tested for road-ability in accordance with 3.2.2 of SAE ARP1247C and 3.4 (g.) and 3.4 (h.) of this document.

5.3.3.3 Boom stability test. The boom of the product sample(s) shall be operated throughout its operating range to demonstrate (see 3.9) the stability and smooth operation of the product sample. With 700 pounds placed in the enclosed cab of a class A product sample (if applicable) and 500 pounds placed in the enclosed cab of a class B product sample (if applicable) when on level ground, the boom

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shall be extended to the maximum position with no fluid in the de/anti-icing fluid tanks; the unit shall remain stable and shall not overturn.

5.3.3.4 Pump and fluid delivery testing. Manufacturer shall provide test results showing conformance of unit characteristics with all fluid flow values within this document.

5.3.3.5 Air transportability analysis. An engineering analysis shall be performed and presented to demonstrate compliance with 3.3.4.

6. PACKAGING.

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

7. NOTES.

7.1 Intended use. The spraying unit provides the means to deice and anti-ice Air Force aircraft.

7.2 Source of Documents.

7.2.1 The Federal Acquisition Regulation (FAR) may be obtained at www.acqnet.gov/far or from the Superintendent of Documents, Congressional Sales Office, U.S. Government Printing Office, Washington, DC 20402.

7.2.2 Military Specifications, Standards, and Handbooks referenced herein may be obtained at <http://assist.daps.dla.mil> or from the Standardization Documents Order Desk, 700 Robbins Ave, Bldg 4, Section D, Philadelphia, PA 19111-5094.

7.2.3 ANSI Standards may be obtained at www.ansi.org or from American National Standards Institute, 25 West 43rd Street, New York, NY 10036.

7.2.4 SAE Standards may be obtained at www.sae.org or from the Society of Automotive Engineers, Inc., 400 Commonwealth Drive, Warrendale, PA 15096.

7.2.5 AWS Standards may be obtained at <http://www.anweld.org/> or from the American Welding Society, 550 N.W. LeJeune Road, Miami, FL 33126.

7.2.6 UL Standards may be obtained at <http://www.ul.com/> or from the Underwriters Laboratories, 333 Pfingsten Road, Northbrook, IL 60062-2096.

7.2.7 NFPA Standards may be obtained at <http://www.nfpa.org/> or from the National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471.

7.2.8 ATA Specifications may be obtained at <http://www.airlines.org/products/pubs/> or from the Air Transport Association, ATA Publications Department, 1301 Pennsylvania Avenue, NW, Suite 1100, Washington, DC 20004.

7.3 Ordering data. The contract or order will specify the following:

- a.. CID document and revision.
- b. Product conformance provisions.
- c. Finish color required if not Forest Green (see 3.19.1).
- d. Whether a product familiarization video is required.

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7.4 Key words.

- a. boom and enclosed cabs
- b. decontaminating
- c. extended reach
- d. heated and unheated

7.5 Changes from previous issue. Asterisks (or vertical lines) are not used in this revision to identify changes with respect to the previous issue due to the extensive changes.

MILITARY INTERESTS:

Custodians:
Air Force – 99

Preparing activity:
Air Force – 84

Agent: Air Force – 99

(Project 1730-2008-003)

NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using the ASSIST Online database at <http://assist.daps.dla.mil> .