

Boundary Layer Control System; Pressure

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### 1. SCOPE:

- 1.1 This specification covers pressure boundary layer control systems of turbo-jet and turbo-prop aircraft for increasing the aerodynamic lift of the wings and flaps during approach, landing, and takeoff.

### 2. APPLICABLE DOCUMENTS:

#### 2.1 Government documents normally furnished:

The following documents, of the issue in effect on date of invitation for bids or request for proposal, form a part of this specification to the extent specified herein.

#### SPECIFICATIONS

##### Military

MIL-D-8708 Demonstration Requirements for Airplanes

MIL-B-81365 Bleed Air Systems, General Specification for

(When requesting applicable documents, refer to both title and number. Copies of unclassified documents may be obtained from the Commanding Officer, Naval Supply Depot (Code 1051), 5801 Tabor Avenue, Philadelphia, Pennsylvania 19120. Requests for copies of classified documents should be addressed to the Naval Supply Depot, via the cognizant Government inspector.)

### 3. REQUIREMENTS:

#### 3.1 Prototype component inspection:

The boundary layer control system furnished under this specification shall be a product which has been inspected and has passed the prototype component inspection specified herein.

#### 3.2 General:

The requirements of MIL-B-81365 shall apply as requirements of this specification with the exceptions and additions specified herein. When the two specifications conflict this specification shall govern.

#### 3.3 Design and construction:

- 3.3.1 Multi-engine aircraft: For multi-engine aircraft, provisions shall be made to prevent loss of boundary layer control air to a non-operating engine.

- 3.3.2 Manual operation: The boundary layer control system shall be operated by a single control in each cockpit. The control shall be the same control that actuates the wing flaps.

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- 3.3.3 Controls: Controls shall be provided for symmetrical operation of the boundary layer control system. The controls shall be designed to preclude asymmetric flow over the wings and wing flaps.
- 3.3.4 Signal lights: Signal lights shall be provided on the instrument panel that shall indicate any abnormal condition in the boundary layer control system. The switches, wires, and other parts of the warning system shall be protected against deterioration from hot air. In dual flight-control aircraft separate signal lights shall be provided for each pilot unless a single set of signal lights is clearly visible to each pilot.

### 3.4 Performance:

The boundary layer control system and components shall meet the performance requirements of MIL-B-81365.

## 4. QUALITY ASSURANCE PROVISIONS:

### 4.1 Responsibility for inspection:

Unless otherwise specified in the contract or purchase order, the supplier is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified, the supplier may utilize his own facilities or any commercial laboratory acceptable to the Government. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

### 4.2 Classification of inspection:

The inspection of the boundary layer control system shall be classified as follows:

- a. Prototype component inspection
- b. Quality conformance inspection

### 4.3 Prototype component inspection:

Prototype component inspection on the boundary layer control system shall consist of the following and in the order listed:

#### Sample 1 (Components and ducting)

- (a) Proof pressure (4.5.2)
- (b) Endurance (4.5.3)
- (c) Flow resonance (4.5.4)
- (d) Burst pressure (4.5.5)

#### Sample 2 (Bellows, valves, and ducting)

- (a) Vibration (4.5.6)

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4.3.1 Sampling for prototype component inspection: Unless otherwise specified, as soon as practicable after award of a contract or order, the contractor shall furnish prototype samples for inspection to determine conformance with this specification. Prototype samples shall consist of two complete boundary layer control systems on contract or order. The samples shall be identified with the manufacturer's part number and contract number and shall be inspected as specified herein and in accordance with the contract or order (see 6.2).

4.3.1.1 A sample shall consist of all components necessary to assemble a complete system.

4.4 Quality conformance inspection:

The quality conformance inspection shall consist of individual inspection.

4.4.1 Individual inspection: Each boundary layer control system on the contract or order shall be subjected to the following inspection in the order listed. Any system component containing a defect or failing to pass any of these tests shall be rejected and replaced. After replacement of the component, the system shall be completely reinspected in the order listed.

- a. Examination (4.5.1)
- b. Ground operation (4.5.7)
- c. Flight (4.5.8)

4.5 Inspection methods:

4.5.1 Examination: The system shall be thoroughly examined to determine conformance with this specification and applicable drawings with respect to all the requirements not covered by tests.

4.5.2 Proof pressure: The boundary layer control system shall be subjected to and shall pass the proof pressure test specified in MIL-B-81365.

4.5.3 Endurance: The boundary layer control system shall be subjected to and shall pass the endurance test specified in MIL-B-81365.

4.5.4 Flow resonance: The boundary layer control system shall be subjected to and shall pass the flow resonance test specified in MIL-B-81365.

4.5.5 Burst pressure: The boundary layer control system shall be subjected to and shall pass the burst pressure test specified in MIL-B-81365.

4.5.6 Vibration: The boundary layer control system shall be subjected to and shall pass the vibration test specified in MIL-B-81365.

4.5.7 Ground operation: Ground operation tests of the system shall be conducted with the aircraft at rest using full operating pressure to demonstrate system control, general security, structural integrity, and safety of the system for flight. The boundary layer control system shall show no evidence of leaks.