SAE Aerospace
An SAE International Group

AEROSPACE STANDARD

SAE AS7283

REV. A

Issued 1991-11
Revised 2004-08

Superseding AS7283

Gaskets, Type XX Engine Accessory Drive Corrosion Resistant Steel Screen Reinforced Controlled Performance

FSC 5330

1. SCOPE:

1.1 Form:

This procurement specification covers flat gaskets for aircraft engine accessory drive, Type XX, in accordance with AS20010 (replacing AND20010).

1.2 Application:

Primarily for use between propeller controls and aircraft engine accessory mounting pads on turboprop and reciprocating engines.

2. REFERENCES:

2.1 Applicable Documents:

The following publications form part of this specification to the extent specified herein. The latest issue of SAE publications shall apply. The applicable issue of other documents shall be the issue in effect on the date of the purchase order. In the event of conflict between the text of this document and references cited herein, the text of this document shall take precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

TO PLACE A DOCUMENT ORDER:
Tel: 877-606-7323 (inside USA and Canada)
Tel: 724-776-4970 (outside USA)
Fax: 724-776-0790
Email: custsvc@sae.org
SAE WEB ADDRESS: **http://www.sae.org**

2.1.1 SAE Publications: Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

AMS 2810	Identification and Packaging, Elastomeric Products
AMS 4120	Aluminum Alloy, Bars, Rods, and Wire, Rolled, or Cold Finished, 4.4Cu 1.5Mg 0.60Mn, Solution Heat Treated and Naturally Aged
AS8879	Screw Threads - UNJ Profile, Inch
AS9144	Gasket - Type XX Engine Accessory Drive
AS9502	Bolt, Machine - Hexagon Head, Drilled, 1 Hole, Full Shank, Cres, UNS S66286, 130 ksi min, .3125-24 UNF-3A
AS100026 thru AS100035	Safety Wire, Cres, AMS 5685
AS20010	Drive - Type XX Engine Accessory - Design Standard for

2.1.2 U.S. Government Publications: Available from The Department of Defense Single Stock Point for Military Specifications, Standards and Related Publications (DODSSP) through the web at http://www.dodssp.dapsmil or in writing at DODSSP, Building 4 / Section D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.

MIL-STD-2073-1	Standard Practice for Military Packaging
MS17301	Stud - Straight, .3125-18 x .3125-24 (AS8879)

2.1.3 ASME Publications: Available from the American Society of Mechanical Engineering (ASME) through the web at http://www.asme.org or in writing at ASME, 22 Law Drive, Box 2900, Fairfield, NJ 07007-2900.

ANSI Y14.5M-1982	Dimensioning and Tolerancing

2.1.4 ASTM Publications: Available from ASTM through the web at http://www.astm.org or in writing at 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

ASTM D 413	Standard Test Methods for Rubber Property - Adhesion to Flexible Substrate
ASTM D 471	Test for Rubber Property - Effect of Liquids
ASTM D 573	Test Method for Rubber - Deterioration in an Air Oven

2.2 Definitions:

PRODUCTION INSPECTION LOT:

Shall be all finished parts of the same part number made from the same batch of compound processed in one continuous run and presented for vendor's inspection at one time.

BATCH:

The quantity of compound run through a mill or mixer at one time.

2.3 Unit Symbols:

% - percent (1% = 1/100)

lbf - pound-force

°C - degree Celsius

kN - kilonewton

psi - pounds per square inch

HRC - hardness Rockwell C scale

in-lbf - inch-pound, moment

lbf-in - pound-inch, torque

cps - cycles per second

3. TECHNICAL REQUIREMENTS:

3.1 Material:

Shall consist of screen made of corrosion resistant steel wire of 18Cr-8Ni (UNS S30400) or 17Cr-12Ni (UNS S31600) type firmly bonded between two thicknesses of rubberlike material.

3.2 Design:

Shall conform to the requirements of the drawing (e.g., AS9144).

3.3 General Characteristics:

3.3.1 Corrosion: Gaskets shall have no corrosive effect on other materials when exposed to conditions normally encountered in service. Discoloration of metal shall not be considered objectionable.

3.3.2 Removability: Gaskets shall be removable from an assembly without delamination due to excessive sticking.

3.4 Properties:

Gaskets shall conform to the following properties:

3.4.1 As Received:

3.4.1.1 Compressibility: When tested as in 4.4.1, the compression of the gasket material shall be not more than 25% of the as received thickness.

3.4.1.2 Compression Set: When tested as in 4.4.1, the compression set of the gasket material shall be not more than 15% of the as received thickness.

3.4.1.3 Adhesion: When tested as in 4.4.2, adhesion between components shall be not less than 8 lbf per inch.

3.4.1.4 Leakage: When tested as in 4.4.3, leakage shall show no perceptible accumulation of oil at the periphery of the gasket, and shall be not more than 1 drop per minute from any internal opening.

3.4.2 Lubricating Oil Resistance: After immersion for 70 hours at 100 °C ± 1 in ASTM Oil No. 1, the immediate deteriorated properties shall conform to the following limits when tested as in 4.4.4, unless otherwise specified on the part drawing.

3.4.2.1 Thickness Change: 0 to +10%

3.4.2.2 Compressibility: 25% maximum

3.4.2.3 Compression Set: 20% maximum

3.4.2.4 Decomposition: None

3.4.2.5 Surface Tackiness: None

3.4.2.6 Adhesion: 6 lbf per inch minimum between components

3.4.2.7 Leakage: Shall show no perceptible accumulation of oil at the gasket periphery, and not more than 1 drop per minute leakage from any internal opening when tested as in 4.4.3.

3.4.3 Nonaromatic Fuel Resistance: After immersion for 5 hours at 20 to 30 °C in ASTM Reference Fuel A, the immediate deteriorated properties shall conform to the following limits when tested as in 4.4.4, unless otherwise specified on the part drawing.

3.4.3.1 Thickness Change: 0 to +15%

3.4.3.2 Compressibility: 30% maximum

3.4.3.3 Compression Set: 25% maximum

3.4.3.4 Leakage: Shall show no perceptible accumulation of oil at the gasket periphery, and not more than 1 drop per minute leakage from any internal opening when tested as in 4.4.3.

3.4.4 Water Resistance: After immersion for 24 hours at 20 to 30 °C in distilled water, the immediate deteriorated properties shall conform to the following limit when tested as in 4.4.4:

3.4.4.1 Thickness Change: 0 to +15%

3.4.5 Dry Heat Resistance: After air aging 70 hours at 100 °C ± 1, the properties within 10 to 15 minutes after removal shall conform to the following limits when tested as in 4.4.5, unless otherwise specified on the part drawing.

3.4.5.1 Compressibility: 20% maximum

3.4.5.2 Compression Set: 10% maximum

3.4.5.3 Leakage: Shall show no perceptible accumulation of oil at the gasket periphery, and not more than 1 drop per minute leakage from any internal opening when tested as in 4.4.3.

3.4.6 Vibration Resistance: When tested as in 4.4.6, mounted gasket under the test vibration shall resist changes, such as compression, to the extent that no failure will be induced to any of the mounting studs in less than 25 hours.

3.5 Quality:

Parts shall be uniform in quality and condition, clean, smooth, as free from foreign material as commercially practicable, and free from imperfections detrimental to the usage of the part.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection:

The vendor of parts shall supply all samples and shall be responsible for performing all required tests. Purchaser reserves the right to perform such confirmatory testing as deemed necessary to ensure that the parts conform to the requirements of this specification.

4.2 Classification of Tests:

4.2.1 Acceptance Tests: Tests to determine conformance to the requirements in Table 1 are classified as acceptance tests and shall be performed on each production inspection lot:

TABLE 1 - Acceptance Tests

Requirement	Paragraph Reference
Design, dimensions and tolerances	3.2
Compressibility, as received	3.4.1.1
Compression set, as received	3.4.1.2
Adhesion, as received	3.4.1.3
Leakage, as received	3.4.1.4
Decomposition after immersion in lubricating oil	3.4.2.4
Surface tackiness after immersion in lubricating oil	3.4.2.5
Vibration resistance	3.4.6

4.2.2 Periodic Tests: Tests to determine conformance to the requirements in Table 2 are classified as periodic tests and shall be performed at a frequency selected by the vendor or unless frequency of testing is specified by purchaser:

TABLE 2 - Periodic Tests

Requirement	Paragraph Reference
Corrosion, as received	3.3.1
Removability	3.3.2
Thickness change after immersion in lubricating oil	3.4.2.1
Compressibility after immersion in lubricating oil	3.4.2.2
Compression set after immersion in lubricating oil	3.4.2.3
Adhesion after immersion in lubricating oil	3.4.2.6
Leakage after immersion in lubricating oil	3.4.2.7
Thickness change after immersion in fuel	3.4.3.1
Compressibility after immersion in fuel	3.4.3.2
Compression set after immersion in fuel	3.4.3.3
Leakage after immersion in fuel	3.4.3.4
Thickness change after immersion in distilled water	3.4.4.1
Compressibility after dry heat exposure	3.4.5.1
Compressibility set after dry heat exposure	3.4.5.2
Leakage after dry heat exposure	3.4.5.3
Vibration resistance	3.4.6

4.2.3 Preproduction Tests: Tests for all technical requirements are classified as preproduction tests and shall be performed prior to or on the first-article shipment of parts to a purchaser, when a change in material, processing, or both requires reapproval as in 4.5.2, and when purchaser deems confirmatory testing to be required.

4.2.3.1 For direct U.S. Military procurement, substantiating test data and, when requested, preproduction test material shall be submitted to the cognizant agency as directed by the procuring activity, contracting officer, or request for procurement.

4.3 Sampling:

Shall be as follows:

4.3.1 For Acceptance Tests: Sufficient parts shall be taken at random from each production inspection lot to perform all required tests; the number of determinations for each requirement shall be as specified in the applicable test procedure or, if not specified therein, not less than three.

4.3.1.1 When statistical sampling plan and acceptance quality level (AQL) have been agreed upon by purchaser and vendor, sampling shall be in accordance with such plan in lieu of sampling as in 4.3.1 and the report of 4.6 shall state that such plan was used.

4.3.2 For Periodic Tests: As in 4.3.1 for the batch from which the samples are taken.

4.3.3 For Preproduction Tests: As agreed upon by purchaser and vendor.

4.4 Test Methods:

Properties shall be determined in accordance with the following test methods:

4.4.1 Compressibility and Compression Set, As Received: Cut specimens nominally 0.50 inch diameter, or other shape of equivalent area provided width is not less than 0.25 inch at any section, from flat gasket areas containing no beads, ridges, or holes. Measure thickness of specimens accurately. Subject each specimen to load of 4.9 kN for 2 minutes in a standard compression testing machine using a nominal 1.00 inch diameter flat steel disc or plate for compressing specimen, and measure thickness while still under load. Remove load, allow specimen to stand for 10 minutes, and again measure thickness. Compressibility shall be calculated as the difference, in percentage, between the original thickness and the thickness measured under load. Compression set shall be calculated as the difference, in percentage, between the original thickness and the thickness 10 minutes after removal of the 4.9 kN load.

4.4.2 Adhesion Between Components, As Received: Test in accordance with ASTM D 413, using specimens nominally 0.50 inch wide, cut from gaskets and containing no holes.

4.4.3 Leakage, As Received: Use full size gaskets as specimens. Before installing in test fixture, flex gasket by wrapping around a nominally 1.00 inch diameter rod, first with longitudinal axis of gasket parallel to axis of rod and then with transverse axis of gasket parallel to axis of rod. Repeat flexing, using opposite face of gasket in contact with rod. Clamp gasket in a fixture consisting of two flat, rigid plates, conforming to the shape of the gasket and provided with the necessary fittings and a source of aircraft engine lubricating oil at room temperature, so that a load of 15 000 lbf ± 2000 is uniformly distributed over the entire gasket area. Subject gaskets to the following conditions for 15 minutes:

a. 800 psi oil pressure from the two oil delivery holes to adjacent openings or free edges.

b. 300 psi oil pressure from screened opening and pressure outlet hole to adjacent openings or free edges.

4.4.4 Effect of Liquids on Properties: The following properties shall be determined in accordance with ASTM D 471, unless otherwise specified on part drawing, after immersion in the specified liquids:

4.4.4.1 Lubricating Oil Resistance: After immersion as in 3.4.2 in accordance with ASTM D 471, the following properties shall be determined:

a. Percent thickness change

b. Percent compressibility tested as in 4.4.1

c. Percent compression set tested as in 4.4.1

d. Decomposition

e. Surface tackiness

f. Adhesion between components tested as in 4.4.2

g. Leakage tested as in 4.4.3

4.4.4.2 Nonaromatic Fuel Resistance: After immersion as in 3.4.3 in accordance with ASTM D 471, the following properties shall be determined:

a. Percent thickness change

b. Percent compressibility tested as in 4.4.1

c. Percent compression set tested as in 4.4.1

d. Leakage tested as in 4.4.3

4.4.4.3 Water Resistance: After immersion as in 3.4.4 in accordance with ASTM D 471, the percent thickness change shall be determined.

4.4.5 Dry Heat Resistance: The following properties shall be determined after air aging as in 3.4.5 in accordance with ASTM D 573:

a. Percent compressibility tested as in 4.4.1

b. Percent compression set tested as in 4.4.1

c. Leakage tested as in 4.4.3