

FED. SUPPLY CLASS

3020

1. SCOPE

This specification covers blank configurations, gear data and tolerances for 20° fine pitch spur gears having standard addendums as depicted in NAS726 and used extensively in airborne computers and control instruments where low-inertia, low-torque characteristics are required. The specification is not intended to cover gears wherein the gear drives a pinion having less than 17 teeth which require special attention to be given to the relative length of the arc of recess to the arc of approach.

- 1.1 **Classifications.** Because of the transient nature of gear classification terminology resulting from rapid technical advances, this specification and its related standard avoids the use of AGMA-ASA gear quality classifications. Instead numerical values for total composite error and tooth-to-tooth composite error according to AGMA Standards are used to identify gear quality.

2. APPLICABLE DOCUMENTS

- 2.1 The following specifications and standards, of the issue in effect on the date of invitation for bids, form a part of this specification to the extent specified herein.

Military

MIL-S-5002 Surface Treatments (except Priming and Painting) for Metal Parts for Aircraft
MIL-S-7720 Steel, Corrosion-Resistant (18-8) Bars and Forging Stock (Aircraft Quality)
MIL-S-7742 Screw Threads, Standard, Aeronautical
MIL-A-8625 Anodic Coatings for Aluminum and Aluminum Alloys
MIL-STD-130 Identification Marking of U.S. Military Property

Federal

QQ-A-268 Aluminum Alloy 24S; Bars, Rods, and Wire Rolled or Drawn
QQ-A-355 Aluminum Alloy (2024), Plate and Sheet
QQ-S-763 Steel Bars, Shapes and Forgings, Corrosion-Resisting

Copies can be obtained from the Department of Defense Single Stock Point (DODSSP). <http://dodssp.daps.dla.mil>

ASME

ANSI B6.11 Inspection of Fine Pitch Gears

Copies can be obtained from ASME, Three Park Ave., New York, NY 10016-5990. www.asme.org

ASTM International

ASTM B139/B139M Standard Specification for Phosphor Bronze Rod, Bar, and Shapes

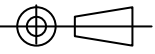
Copies can be obtained from ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959. www.astm.org

SAE International

AMS-S-7720 Steel, Corrosion-Resistant (18-8) Bars, Wire and Forging Stock (Aircraft Quality)
AMS-QQ-A-225/6 Aluminum Alloy, 2024, Bar, Rod, and Wire; Rolled, Drawn, or Cold Finished - UNS A92024
AMS-QQ-A-250/4 Aluminum Alloy 2024, Plate and Sheet - UNS A92024
AMS-QQ-S-763 Steel, Corrosion Resistant, Bars, Wire, Shapes, and Forgings

Copies can be obtained from SAE International, 400 Commonwealth Dr., Warrendale, PA 15096-0001. www.sae.org

① COMPLETELY REVISED

THIRD ANGLE PROJECTION 	CUSTODIAN NATIONAL AEROSPACE STANDARDS COMMITTEE	REVISION 1
PROCUREMENT SPECIFICATION NONE	TITLE GEAR, SPUR, 20° INVOLUTE, LOW INERTIA, 48 AND FINER PITCH ①	CLASSIFICATION SPECIFICATION NAS727 SHEET 1 OF 6

AEROSPACE INDUSTRIES ASSOCIATION OF AMERICA, INC.
1000 WILSON BLVD.
ARLINGTON, VA 22209

THIS DRAWING SUPERSEDES ALL ANTECEDENT STANDARD DRAWINGS FOR THE SAME PRODUCT AND SHALL BECOME EFFECTIVE NO LATER THAN SIX MONTHS FROM THE LAST REVISION DATE.

FORM 09-01

REVISION DATE: MAY 31, 2012

ISSUE DATE: SEPTEMBER 1960

American Society for Quality

ANSI/ASQ Z1.4 Sampling Procedures and Tables for Inspection by Attributes

Copies can be obtained from the American Society for Quality, 600 North Plankinton Ave., Milwaukee, WI 53203.
www.asq.org

American Gear Manufacturer's Association

AGMA 236.04 Inspection of Fine Pitch Gears
AGMA 207.04 20-degree Involute System for Fine Pitch Spur and Helical Gears
AGMA 1003-H07 Tooth Proportions for Fine- Pitch Spur and Helical Gearing

Copies can be obtained from the American Gear Manufacturer's Association, 500 Montgomery Street,
Suite 350, Alexandria, VA 22314-1587. www.agma.org

3. REQUIREMENTS

- 3.1 Tooth Form. The tooth form system used for gears covered by this specification shall be in accordance with AGMA 207.04 and AGMA 1003-H07, 20 Degree Involute System for Fine Pitch Spur and Helical Gears.
- 3.2 Gear Size and Quality
- 3.2.1 Measurement-Over-Wires. The size of gears covered by this specification shall not be expressed in terms of measurement-over-wires. Over-wire-measurements may be used for reference purposes or for measurement purposes during fabrication. However, final size determination for acceptance, inspection, or qualification tests shall depend on testing radius measurements (see 3.2.2).
- 3.2.2 Testing Radius Measurements. The size of gears covered by this specification shall be determined by test radius measurements according to AGMA 236.04, and shall be within the limits specified in the detail specification or drawing.
- 3.2.3 Total Composite Error. Unless otherwise specified in the detail specification, the rotational quality of gears covered by this specification shall be determined by total composite error measurements according to AGMA 236.04 and shall be equal to or less than the value specified.
- 3.3 Bore Size. The basic bore size shall be as specified in the applicable drawing. Bore tolerances shall be in accordance with the gear classification as noted in the tabulated tolerances. (See Table I of NAS726).
- 3.3.1 Bellmouth of Bore. Bellmouth of bore is an extreme taper occurring at the ends of the bore. The total length of all the bell-mouthed portions must not exceed 20 percent of the overall length of the bore.
- 3.4 External Corners. All external corners except those adjacent to the contact surface of the gear teeth shall be broken either by chamfer or radius, an amount not to exceed .010 inches.
- 3.5 Deburring. All gears shall be deburred. Burrs visible under a 10X magnification shall be cause for rejection. Edges adjacent to the contact surface of the teeth may be broken a maximum of 20 percent of one divided by the diametral pitch. Deburring of aluminum gears which will subsequently be anodized shall be performed in such a manner that all external edges of the teeth shall be rounded to a minimum radius of .001 inches to a maximum of 30 percent of the addendum unless some other provision is made to avoid sharp edges on which the anodizing may peak.
- 3.6 Surface Roughness. The roughness of the working surface of the gear teeth and the bore shall be as smooth or smoother than that specified in the tabulated tolerances of Table I of NAS726 when inspected in accordance with 4.3.4.

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REVISION
1
NAS727
SHEET 2



Documents

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