AEROSPACE STANDARD

AS5259™ REV. A

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Revised 2021-07

Superseding AS5259

(R) Crimping Tool and Accessories, Electrical, Crimp Barrel Size 8 to 4/0, General Purpose Use

FSC 5120

RATIONALE

Full revision required to address AIR1351 life characteristics, crimp pressure, quality assurance requirements, qualification requirements, and minor technical or editorial changes as needed.

1. SCOPE

AS5259 covers design requirements, performance requirements, and methods of procurement for tools and associated accessories used to crimp wire barrels of aircraft electrical wiring components including ferrules, terminals, splices, and connector contacts on wire/cable sizes 8 to 4/0.

1.1 Intended Use

The purpose of AS5259 is to define a tool and die configuration in detail, and a tool performance. The design details assures tool and die interchangeability, repeatability, and reliability, but not the tool's component crimp characteristics. The crimp characteristics (tensile strength, etc.) are defined by the component specification which specifies the crimp tool. The ability of the tool to properly crimp a component is determined by the component specification or the engineering drawing which specifies the tool. Tools defined by AS5259 are recommended to be used only for those components which specifically call out the use of the tool in the component specification or engineering drawing (see 3.1.1).

1.2 Qualification

The tool furnished under AS5259 shall be products that have been tested and have passed the qualification tests specified herein and have been listed on or approved for listing on the applicable qualified products list (see 7.2). Part numbers listed in the detail specification can only be used by a supplier qualified by the qualifying activity. A supplier that is no longer qualified may only use the part number for a purchase order, if the supplier was qualified by the qualifying activity at the time when the purchase order was approved by the purchaser.

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SAE WEB ADDRESS: http://www.sae.org

For more information on this standard, visit
https://www.sae.org/standards/content/AS5259A/

1.3 Tools for U.S. Military Activities

Tools defined by AS5259 (see 2.1.1) are considered Class 1 tools. Class 1 tools are intended for use by U.S. military service activities. These tools will be the only style stocked by the services and supplied to their activities. Tools for crimping Class 1 terminals and conductor splices are listed on the applicable component detail specification. Class 2 tools are not typically used by U.S. military equipment manufacturer (supplier), but in some cases are used by the military repair activities when recommended by the manufacturer (supplier). Unless specifically justified by the military procuring activity, Class 2 tools will not be procured or stocked by military or supplied to the services unless justified for Class 2 application by that activity. Class 2 tools will not be substituted by the military stocking activity with Class 1 tools. In cases where a Class 1 tool is not available, the component detail specification will specify a Class 2 tool controlled by a tool supplier. Class 2 tools specified by a detail specification are acceptable for purchase by the military procurement activity (see 7.4).

1.4 Part Number Structure

The part number structure for the tool, related accessory (i.e., dies, release tool, etc.), and kit shall be:

M5259/1- 01 A

- A — Storage container designator (blank for no kit)
- 01 — Basic tool designation (-01), each accessory (-02, -03, etc.)
- M5259/1- — Detail specification designation

Military standards (MS) part numbers superseded by AS5259 are maintained (i.e., MS25441-1, MS25442-1A, etc.).

2. REFERENCES

2.1 Applicable Documents

The following publications form a part of this document to the extent specified herein. The latest issue of the SAE publications shall apply. The applicable issue of other publications 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 takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

2.1.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

AIR1351	Manufacturers' Identification of Aerospace Electrical and Electronic Wiring Devices and Accessories
AS9138	Aerospace Series - Quality Management Systems Statistical Product Acceptance Requirements
AS5259/1*	Crimping Tool and Accessories, Remote Crimp Head, Hydraulic, Wire Size 8 to 0000 for Insulated and Un-Insulated Crimp Barrels
AS5259/2*	Crimping Tool and Accessories, Hydraulic Pumps, 10000 psi Minimum
AS5259/3*	Crimping Tool and Accessories, Hand Operated, Die Type, Wire Sizes 8 to 0000 Un-Insulated and Insulated Crimp Barrels
AS5259/4*	Crimping Tool And Accessories, Remote Crimp Head, Hydraulic, Wire Size 8 to 00 Un-Insulated and 8 thru 2 Insulated Crimp Barrels
AS5259/5*	Crimping Tool and Accessories, Hand Operated, Lightweight, Die Type, Wire Size 8 to 00 Un-Insulated and 8 thru 2 Insulated Crimp Barrels
AS5259/6*	Crimping Tool and Accessories, Inspection Gages, for AS5259 Dies

AS5259/7*	Crimping Tool and Accessories, Dies, Wire Size 8 to 0000 Un-Insulated and Insulated Crimp Barrels
AS5259/8*	Crimping Tool and Accessories, 18 VDC Battery Electric, Portable Hydraulic, Wire Size 8 to 00 Un-Insulated, and Size 8 Through 2 Insulated Crimp Barrels
AS7928	Terminals, Lug: Splices, Conductor: Crimp Style, Copper, General Specification for
AS20659	Terminal, Lug, Crimp Style, Copper, Uninsulated, Ring Tongue, Type I, Class 1, for 175 °C or 260 °C Total Conductor Temperature

*AS5259 detail specification.

2.1.2 ASQ Publications

Available from American Society for Quality, 600 North Plankinton Avenue, Milwaukee, WI 53203, Tel: 800-248-1946 (United States or Canada), 001-800-514-1564 (Mexico), or +1-414-272-8575 (all other locations), www.asq.org.

ANSI/NCSL Z540.3 Requirements for the Calibration of Measuring and Test Equipment

2.1.3 U.S. Government Publications

Copies of these documents are available online at https://quicksearch.dla.mil.

MIL-STD-202	Test Methods for Electronic and Electrical Component Parts
Sam*	System Awards Management
SD-6	Provisions Governing Qualification

*Available from https://www.sam.gov/portal/public/SAM/.

2.1.4 ASTM Publications

Available from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9585, www.astm.org.

ASTM D3951 Package, Commercial

2.2 Definitions

2.2.1 SAE PREPARING ACTIVITY

SAE preparing activity is the SAE sub-committee responsible for preparing and maintaining the product specification and the required technical data.

2.2.2 2.2.2QUALIFICATION INSPECTION

Qualification inspection is a process that demonstrates that a component is capable of fully conforming to all the requirements defined in a specification. Qualification inspection includes definition of the measurements, tests, analysis, and associated data which provides consistent rationale for acceptance of a particular supplier's design as meeting the specification requirements typically prior to acquisition by the purchaser.

2.2.3 QUALIFIED PRODUCTS LIST

A qualified products list is a list of suppliers whose products have been evaluated to a defined process and who are authorized to provide those products to a purchaser upon request. When a qualified products list is specified, only approved suppliers are authorized to provide products under the part number defined in the component specification. A qualified products list is established and maintained by a qualifying activity.

2.2.4 QUALIFYING ACTIVITY

A qualifying activity is a function established by a purchaser or group of purchasers that has a defined process used to consistently evaluate all suppliers' products in accordance with the component specification (see Section 6).

2.2.5 QUALITY CONFORMANCE INSPECTION

Quality conformance inspection is a process which includes measurements, non-destructive tests, analysis, and associated data that will provide verification that a particular individual component continually conforms to the requirements defined in the specification.

2.2.6 QUALIFICATION BY SIMILARITY

An alternative qualification inspection process accomplished without completing all of the measurements, tests, and analysis requirements defined in the specification. Acceptance and the extent of similarity is determined by the qualifying activity. Similarity is established through a rationale that certain designs, materials, and/or processes are identical to those already approved through qualification of the components. Verification testing for the new product is not required for designs, materials, and/or processes already approved. When a qualified products list is being established the qualification by similarity rationale shall be approved by the qualifying activity prior to initiation of the remaining portions of the qualification inspection process.

2.2.7 PURCHASER

A purchaser is an activity that can issue a purchase order or contract.

2.2.8 SUPPLIER (MANUFACTURER)

A supplier is an original component manufacturer or a value-added component manufacturer which has design and production control of the processes used to produce the final component in accordance with the specification.

2.2.9 CAGE

Commercial and government entity (CAGE) for U.S. government manufacturer identification assigned number by the SAM system.

2.2.10 SAM

System for award management (SAM) for U.S. military qualified components

2.2.11 TOOL

A tool as used herein is any crimping component defined by an AS5259 part number (i.e., remote crimp head, man, crimp head-pump combination, etc.).

2.2.12 CLASS 1 TOOL

A tool defined by a commercial or military standard that is maintained by a commercial activity (SAE, NEMA, UL, etc.) or a government agency (DLA, Navy, Army, etc.). AS5259 part numbers represents Class 1 tools (see 7.4).

2.2.13 CLASS 2 TOOL

A tool defined by a manufacturer (supplier) or purchaser control drawing. Commercial part numbers represents Class 2 tools (see 7.4).

2.2.14 COMPONENT PREPARING ACTIVITY

The component preparing activity is an activity that control a component specification or drawing that reference a crimping tool required to assemble a wire or cable to the component specified.

3. REQUIREMENTS

3.1 Detail Specifications

The tool requirements shall be as specified herein and in accordance with the applicable detail specification. In the event of any conflict between the requirements of AS5259 and the detail specification, the latter shall govern

3.1.1 Criteria for Tool Inclusion in a Detail Specification

The criteria for defining a tool in AS5259 detail specification is that a component document intended to reference the tool must be controlled by a component preparing activity such as a user, government, or non-government standard body. It is the responsibility of the component specification preparer to determine if a specific tool can be used to crimp specific wire barrels. After the tool has been determined to be acceptable for the component, the component preparing activity is recommended to request SAE to establish a detail specification (slant sheet) which the activity can then reference in the component specification. Request for tools to be listed in AS5259 shall be made to the SAE-AE-8C2 standards committee (designated preparing activity).

3.1.2 Detail Specification Requirements

Die dimensions shall be definitive enough to ensure that variation from multiple component supplier designs, as defined by the component detail specification, does not affect the die performance. The basic tool dimensions shall be definitive enough to ensure replacement of the tool. A detail configuration of a go/no-go gage or pressure gage shall be provided in the detail specification. Metric equivalents may be provided to the nearest 0.01 mm and shown as (x.xx). Metric equivalents are calculated based on 1 inch equals 25.4 mm. The detail specification shall be formatted as shown in Appendix A. In case of a conflict, English units takes precedent.

3.2 Visual and Mechanical Examination (see 5.1)

Tools and accessories design, and construction shall be in accordance with the detail specification.

3.2.1 Dimensions (see 5.1.1)

Dimensions shall be in accordance with the detail specification. Dimensions in the detail specification are shown after plating when specified.

3.3 Materials (see 5.2)

All materials shall be suitable for the fabrication or maintenance of aerospace hardware when used on land or sea. The material shall be as specified herein or the detail specification. However, when a material is not specified, the material shall be such that the tool conforms to the performance requirements of AS5259. Acceptance or approval of any constituent material shall not be construed as a guarantee of the acceptance of the finished product. When equivalent material is specified, the alternate materials shall be approved by the activity responsible for qualification (see 7.2).

3.4 Storage Container (see 1.4 and 5.1.2)

When a storage container is specified by the detail specification, the tool and related accessories shall be stored in a container specified by the supplier. The storage container shall have the SAE tool part number and the supplier's tool part number permanently attached to top of the case. To ensure ease of tracking individual parts, each accessory (die, gage, etc.) designed to be separated from the tool shall have an individual labeled compartment in the container. All parts shall be individually separated to prevent damage during normal container storage or transportation to and from the work site. The storage container shall be equipped with a carrying handle. The case shall stand without falling when stood with handle in the up position. The case shall not tip over when tested as specified. When the storage container exceed 31 pounds (14.1 kg), the case shall be equipped with self contain wheels and pull handle. The storage container shall meet the corrosion characteristic requirement.

3.5 Tool Instructions (see 5.3)

Each tool shall be provided with concise, clearly written individual instructions containing the following information outlined as shown.

a. Title (must include supplier's storage container name when specified in the detail specification, M5259/Y-XXXX or MS2544X-X, and supplier's part number).

b. Detail actuated tool pictorials (must include M5259/Y-0001 and manufacturer's part number).

c. Detail accessory pictorials (must include AS5259/Y dies, gages, and manufacturer's part numbers).

d. Safety instructions.

e. Operation instructions (must include crimping, gauging, etc.).

f. Maintenance instruction (must be clear, precise, and include pictorial as needed).

g. Replaceable parts (must include supplier's designated part numbers).

h. List of applicable ferrules, terminals, splices, and contacts, etc. (must include specification or component part numbers).

i. Supplier information (must include address and telephone number of supplier).

3.6 Replaceable Parts Control (see 5.4)

All replaceable parts shall be designated by a M5259/Y-XXXX, MS2544X-X, or by supplier part number which is directly referenced on the tool and accessory design drawings used to produce and control the tool configuration and provided in the tool instructions.

3.7 Parts Identification (see 5.5)

Identifications markings shall be durable and withstand typical handling and usage. The marking shall be clearly readable after all specified environmental tests. The identification shall include the supplier's name or trademark in accordance with AIR1351, the supplier part number, and the AS5259/Y-XXXX or MS2544X-X part number (see 1.4).

3.8 Tool Assembly (see 5.6)

The tool shall be easily assembled and disassembled (dies, handles, etc.) in accordance with the tool instruction without special tools (see tool instructions). Special tools shall be specified by part number in the detail specification.

3.9 Tool Operation Characteristics (see 5.7)

3.9.1 Dies Gauging (see 5.7.1)

The dies shall be constructed such that when the dies are in a fully closed position or final crimp position (end face-to-end face), their wear characteristics may be determined by go/no-go gages or equivalent pressure gages as applicable. The gage's general characteristic shall be depicted in the tool instructions. The tool instructions shall provide clear information on how and when to use gages for the applicable component being crimped.

3.9.2 Dies Visual Examination (see 5.7.2)

The dies shall exhibit no cracks, broken parts, or jagged edges.

3.10 Crimp Operation (see 5.8)

3.10.1 Partial Crimp (see 5.8.1)

The tool shall be capable of deliberately aborting a partial crimp without completing the crimp cycle.

3.10.2 Completed Crimp (see 5.8.2)

The tool shall advance the dies with mechanical (human hand action), hydraulic, or air power to perform the crimp cycle. Once crimping action has begun, the tool shall operate in such a manner, that it ensures the proper pressure is being continually applied without release to the dies. When a proper crimp is completed (end face-to-end face for dies), the tool shall reach the preset compression force, and the dies shall separate (automatically or manually). For mechanical tools, the handle will return to its normal position regardless of the orientation of the tool. The tool shall perform a crimp operation and the dies shall return to the fully open position within 5 seconds.

3.11 Handle High Compression Force (Self-Contained Manual Hydraulic Crimp Tools; see 5.9)

Unless otherwise specified in the detail specification, the force to actuate a self-contained manual hydraulic crimp tool (i.e., AS5259/3) shall meet the die gauging and visual examination requirements after the handle is subjected to a 253 pounds (1124 N) actuation force.

3.12 Handle Crimp Compression Force (Self-Contained Manual Hydraulic Crimp Tools; see 5.9.1)

Unless otherwise specified in the detail specification, the force to actuate a tool handle shall not exceed 110 pounds (489 N) when crimping all components listed in the tool instructions for the temperature range of -122 to -5 °F (+50 to -15 °C).

3.13 Wire Barrel Crimp Characteristics (see 5.10)

For each M5259/Y-XXXX or MS2544X-X tool part number, all ferrules, terminals, splices, and contacts which the tool and dies can crimp may be listed in the detail specification and tool instruction, but only as a reference (see 1.1). Abbreviation of the part numbers of components which can be crimped by the tool may be listed to the extent that the appropriate relationship between the dies to the component size is not compromised

3.14 Tool Application Weight (see 5.11)

The weight of the tool when ready to crimp a component shall not exceed 17.6 pounds (8 kg), with the heaviest accessories (when required) attached to the tool.

3.15 Tool Maintenance (see 5.12)

The tool shall be constructed to permit maintenance as a result of normal operation wear and handling without special tools. Clear instructions for maintenance shall be provided in the tool instructions (see 3.5). The tool shall meet the tool gauging requirements after maintenance was performed as specified in 5.12.

3.16 Shock Characteristics (see 5.13)

The tool with all required accessories attached or remote crimp head shall meet the tool gauging and marking legibility requirements, after being subjected to the shock test. Pumps and hoses shall not be tested.

3.17 Humidity Characteristics (see 5.14)

The tool, all accessories or remote crimp head shall meet the tool gauging and marking legibility requirements, after being subjected to the humidity test. No corrosion or water absorption shall be noted. Pumps and hoses shall not be tested.

3.18 Life Characteristics (see 5.15)

The tool shall be disassembled for Maintenance then meet the tool assembly, tool operation characteristics, crimp operation, high compression force, crimp compression force, and crimp characteristic requirements.

3.19 Corrosion Characteristics (see 5.16)

The tool, gages, and dies shall have no corrosion that causes the tool to malfunction or fail to meet the performance requirements of AS5259 of the plated parts or at any parts interface or material boundaries after being subjected to the salt spray test. The tool shall meet the requirements of the tool operation characteristics, crimp operation, and marking legibility after exposure.

3.20 Workmanship (see 5.17)

The tool and accessories shall be constructed to withstand normal strains, jars, vibrations, and such other conditions as are incident to shipping, storage, installation, and service. The tool, gages and accessories shall be free of sharp edges, burrs, and other design or production related characteristics which would hamper the tool's intended performance or cause physical harm to the operator.

4. QUALITY ASSURANCE

4.1 Responsibility for Inspection

Unless otherwise specified in the contract or purchase order, the manufacturer is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract, the manufacturer may use facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the activity responsible for qualification. The purchaser 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 Responsibility for Compliance

All items must meet all technical requirements of the supplier's product specification(s). The inspection set forth in AS5259 shall become a part of the supplier's overall inspection system or quality program. The absence of any inspection requirements in the AS5259 shall not relieve the supplier of the responsibility of assuring that all products comply with all AS5259 requirements and the contract or purchase order. Sampling in quality conformance does not authorize submission of known defective material, either indicated or actual, nor does it commit the Purchaser to acceptance of defective material.

4.3 Test Equipment and Inspection Facilities

Test and measuring equipment and inspection facilities of sufficient accuracy, quality, and quantity to permit performance of the required inspection shall be established and maintained by the supplier. The establishment and maintenance of a calibration system to control the accuracy of the measuring and test equipment shall be in accordance with NCSL Z540-3 or equivalent standard.

4.4 AS9003 Quality Assurance Compliance

The supplier's quality assurance program for tool production shall comply with the AS9003 inspection and test quality system. Independent certification of the processes is not required. Other established and industry recognized quality assurance standards that assure all products produced conform to the contract requirements are acceptable. However, if used, it is the responsibility of the supplier to provide evidence of compliance to AS9003. The qualifying activity reserves the right to monitor, measure, and validate compliance at their discretion.

4.5 Classification of Inspections

The inspections specified herein are classified as follows:

a. Qualification inspection (see 4.7).

b. Retention of qualification inspection (see 4.8).

c. Quality conformance inspection (see 4.9).

4.6 Inspection Conditions

The conditions for the inspections are specified as applicable and all test data shall be compiled in accordance SD-6.

4.7 Qualification Inspection

Qualification inspection shall be in accordance with Table 1. The supplier shall, for each tool tested, use the same ingredients, manufacturing procedures, and methods of inspection as would be used to provide the tool to a purchaser. The qualifying activity shall perform the test designated in Table 1. The supplier is not required to perform the qualifying activity tests, but is required to perform the remaining tests in a laboratory acceptable to the qualifying activity.

4.7.1 Initial Qualification Inspection Procedure

A request for qualification shall be made to the qualifying activity (see 7.2) prior to initiating testing. Testing cannot begin until the supplier has received an authorization letter. The supplier is recommended to provide the qualifying activity a test plan based on the authorization letter to ensure the supplier and qualifying activity maintain communication and document changes as needed. The qualifying activity shall not approve a tool that does not meet the requirements specified herein. The qualifying activity has the authority to impose specific specification test requirements to resolve test failures/discrepancies and to waive testing to verify specific product manufacturing changes or qualifications by similarity (see 4.7.3). Any change in the supplier's process control inspections, quality conformance inspections, or manufacturing control drawings (editorial changes are acceptable) without the express approval of the qualifying activity may result in loss of qualification for that product.

4.7.2 Initial Qualification Report

The qualifying activity shall provide the supplier a data package of all tests performed in accordance with Table 1. The qualifying activity test method procedures shall be made available to the supplier upon request. The supplier shall provide a test report to the qualifying activity for the supplier tests specified in Table 1. The test report shall be signed by the manufacturing authority responsible for ensuring compliance with the specification requirements. The supplier may combine the qualifying activity test data with the supplier's test data into one final test report for customers. The final test report and/or data package shall remain on file with the supplier for a minimum period of 6 years and be available to the qualifying activity upon request. The supplier test report shall contain as a minimum the following information.

a. Copy of all certifications specified herein.

b. The quantitative results for tests specified in Table 1 and the authorization letter.

c. A tabulated comparison of specific values between the tool construction herein and each manufacturing control drawing for components qualified by similarity.

d. Corrective action reports (as applicable).

Table 1 - Technical requirements

Technical Requirements	Requirement Paragraph	Test Method Paragraph	Quality Conformance Inspection
Visual and Mechanical Examination 1/	3.2	5.1	5.1
Dimensions 1/	3.2.1	5.1.1	5.1.1
Materials	3.3	5.2	5.2
Storage Container	3.4	5.1.2	
Tool Instruction 1/	3.5	5.3	5.3
Replaceable Parts 1/	3.6	5.4	
Parts Identification 1/	3.7	5.5	5.5
Tool Assembly 1/	3.8	5.6	
Dies Gauging 1/	3.9.1	5.7.1	5.7.1
Dies Visual Examination	3.9.2	5.7.2	5.7.2
Partial Crimp	3.10.1	5.8.1	5.8.1
Completed Crimp	3.10.2	5.8.2	5.8.2
Handle High Compression Force	3.11	5.9	5.9
Handle Crimp Compression Force	3.12	5.9.1	5.9.1
Wire Barrel Crimp Characteristics	3.13	5.10	
Tool Application Weight	3.14	5.11	
Tool Maintenance	3.15	5.12	
Shock Characteristics	3.16	5.13	
Humidity Test	3.17	5.14	
Life Characteristics 1/, 2/	3.18	5.156	
Corrosion Characteristics	3.19	5.16	
Workmanship	3.20	5.17	5.17

1/ Test to be performed by the qualifying activity.
2/ Life cycle is for initial qualification only.

4.7.3 Qualification by Similarity

Qualification by similarity to qualified tool is permissible for those tools and accessories of the same type when the materials, design, and manufacturing processes are identical except for non-essential dimensions that differ due to minor design considerations or differing applications for the product. Production samples approved for similarity is not required, but the supplier shall compare drawing dimensions to the detail specification dimensions (see 4.7.2c). When materials, design, and manufacturing processes differ, sufficient testing to prove the adequacy of the affected characteristic may be required to obtain qualification by similarity. Full details of the similarities and differences, with proposed tests shall be submitted to the activity responsible for qualification for approval prior to commencing testing.

4.7.4 Initial Qualification Sample

Unless otherwise specified in the test methods, one tool for the supplier tests and one tool for the qualifying activity tests shall be evaluated for each test specified in Table 1. The supplier shall, for each tool tested, use the same ingredients, manufacturing procedures, and methods of inspection as would be used to provide the tool to a purchaser.

4.8 Retention of Qualification Inspection

Retention of qualification inspection shall be performed every 36 months from the original qualification approval date. The qualifying activity shall notify the qualified supplier of the submission date by an authorization letter with the requirements for submission. The submission date may be modified by the qualifying activity to accommodate the qualifying activity schedules. The retention of qualification tests shall be the qualifying activity tests specified in Table 1 and shall be performed by the qualifying activity.

4.8.1 No Production During Retention of Qualification Period

If no production of the qualified products has occurred for the retention of qualification reporting period, the supplier may provide a certification to the qualifying activity that no changes in the product materials, manufacturing processes, or site of production has occurred since the previous qualification inspection period. Certification for more than one reporting period shall require qualifying activity approval, but no more than two period of certification is permitted. The supplier shall contact the qualifying activity to determine the conditions of the certification. The supplier may be required to submit the certification on a specified form provided by the qualifying activity and a test report to substantiate the certification.

4.8.2 Retention of Qualification Samples

Unless otherwise specified in the test methods, one tool shall be evaluated for each qualifying activity test specified in Table 1. The supplier shall, for each tool tested, use the same ingredients, manufacturing procedures, and methods of inspection as would be used to provide the tool to a purchaser.

4.8.3 Design, Material, and Process Changes During Retention of Qualification Intervals

Except for changes approved by the purchase order, the parts supplied under purchase order shall be the same design, material formulations, material sources, and manufacturing processes as approved by the qualifying activity for initial qualification. It is the responsibility of the supplier (manufacturer) to notify the qualifying activity when design, materials, material formulations, and manufacturing processes need to be changed. The supplier is responsible for verifying and documenting all performance characteristics including quality conformance and qualification requirements. The qualifying activity may request results of product testing to confirm compliance and approve the change under the existing qualification. The changes are categorized as minor and major.

4.8.3.1 Minor Changes

To address a minor change, the supplier will provide written notification of the change to the qualifying activity at each retention of qualification period and maintain documentation of compliance. A minor change is a change that the supplier has determined does not impact the qualification approval. Examples of minor changes are modification of processing materials, grade types, inks, manufacturing process parameters, integrating processes, and relocating equipment within the qualified manufacturing site.

4.8.3.2 Major Changes

To address a major change, a request for change will be submitted to the qualifying activity. A major change is a change that may impact a specification requirement. The qualifying activity will provide authorization to proceed and define the qualification submittal and third- party testing in accordance with Table 1. All qualification tests identified shall be performed, either by the supplier, the qualifying activity, or an approved third-party laboratory as determined by the qualifying activity.

4.8.4 Retention of Qualification Report

The qualifying activity shall provide the supplier a data package of all tests performed in accordance with Table 1 except for the life test. The qualifying activity test method procedures shall be made available to the supplier upon request. The final test report and/or data package shall remain on file with the supplier for a minimum period of 6 years and be available to the qualifying activity upon request. The supplier shall provide the qualifying activity the following information with the samples:

a. Copy of all certifications specified herein.

b. A summary of the quality conformace results for tests specified in Table 1.

c. Corrective action reports as a result of quality conformance failures.

4.9 Quality Conformance Inspection

Tools shall be selected from the production lot in accordance with ANSI/NCSL Z540.3 inspection level S-4. The tools shall be subjected to the examinations and tests in the sequence specified in table I. All tools shall pass the requirements. Failure of a tool will require corrective action of the lot and another inspection in accordance with ANSI/NCSL Z540.3 inspection level S-4.

4.9.1 Quality Conformance Inspection Repeatability of Results

When a qualified supplier can demonstrate to the qualifying activity by statistical process control in accordance with AS9138 a consistent repeatable results for a Table 1 quality conformance inspection property, the supplier can recommend and be approved by the qualifying activity to no longer perform the test or reduced inspection times or sampling, as well as alternative in-process inspections. For retention of qualification samples, all inspections shall be performed as required.

5. TEST METHODS

5.1 Visual and Mechanical Examination

Tools, and accessories shall be examined to verify that the design and construction are in accordance with AS5259 and applicable detail specification.

5.1.1 Dimensions

Dimensions shall be measured with calibrated tools or equipment in accordance with standard measurement practice.

5.1.2 Storage Container Characteristics

a. Visually examine the container for supplier and M5259/Y part numbers. The part numbers shall be mechanically attached or imprinted on the container.

b. Visually examine to determine if accessories are in individual protective compartments, and properly identified.

c. Weigh the combined weight of tool, accessories, and case to the nearest pound on a calibrated scale.

d. Set the container in a position of rest which places the side with the handle of the container at the highest position from the horizontal. Within 0.5 inch (1.27 cm) from the top of the container on the side perpendicular to the shortest side, apply a force perpendicular to the top of the container to rotate the container 30 degrees from vertical. Repeat on the opposite side of the container. Observe if the storage container is tipped over by these forces.

5.2 Material

The supplier shall certify all specified materials. The qualifying activity reserves the right to request verification of certified materials.

5.3 Tool Instruction Examination

The tool instruction shall be examined for all information specified.

5.4 Replaceable Parts Control Certification

The process which ensures that the replaceable part control requirement is met shall be fully documented and certified by the supplier. The qualifying activity reserves the right to verify this information.

5.5 Parts Identification Examination

All parts shall be examined for the existence and legibility of the part number and supplier name or trademark.

5.6 Tool Assembly Examination

In accordance with the tool instruction, assemble and remove all accessories from the basic tool. Unless otherwise specified by part number in the detail specification, only typical tools found in a mechanic's tool box (i.e., screwdriver, hammer, pliers) shall be used.

5.7 Tool, Operation Characteristic Tests

5.7.1 Dies Gauging

Activate the tool to the fully extended crimp position as defined in the tool instruction. The fully closed position for tools with dies is end face-to-end face at the specified pressure required to crimp the component. The "GO" gage shall be freely inserted in the space between the opposing closed dies of the tool. The "NO-GO" pin of the gage shall not be insertable between the opposing dies of the tool. If equivalent pressure gages are used, perform the gauging in accordance with the supplier's tool instructions.

5.7.2 Dies Visual Examination

The dies shall be examined using 10X magnification for damage.

5.8 Crimp Operation Examination

5.8.1 Partial Crimp

For each die combination, partially crimp a component with the smallest size wire barrel to the smallest wire size listed in the tool instructions. Abort the crimp in accordance with the tool instructions. Then fully crimp the component to the wire and release the handle. Repeat the procedure for each die combination on the specified largest size wire barrel and wire size combination.

5.8.2 Completed Crimp

While performing the completed crimp, measure the time to complete the operation. The time is measured from the time the dies come in contact with the wire barrel until the dies separate to the fully open position. The tool shall complete the crimp on one qualified AS20659 wire size 0000 tin finish terminal (any dash number). The terminal voltage drop and tensile strength shall be performed in accordance with AS7928 to verify the completed crimp. In the event of a terminal failure, the tool shall be reexamined for tool operation characteristics (see 3.9) and test shall be repeated on a different AS20659 dash number, but only to verify the time to complete the crimp.

5.9 Handle High Compression Force Test (Self-Contained Manual Hydraulic Crimp Tools)

A compression force to actuate the tool shall be exerted on the handles of the tool, 1.25 inches ± 0.125 inch (31.8 mm ± 3.2 mm) from the extremities of the handles at a rate of approximately 0.25 inch (6.35 mm) per second until the specified force is reached. The force shall be applied while crimping the component with the largest wire barrel size to the largest wire size specified in the tool instruction. The force shall be continuously applied for 30 second duration. The tool shall then be tested for die gauging and die visual examination.

5.9.1 Handle Crimp Compression Force Test (Self-Contained Manual Hydraulic Crimp Tools)

The tool shall be mounted such that a measurable actuation compression force can be exerted on the handles, 1.25 inches ± 0.125 inch (31.8 mm ± 3.2 mm) from the extremities of the handles. The force shall be measured at room ambient while crimping a component with the largest wire barrel size to the largest wire size specified in the tool instruction at +122 °F ± 2 °F and -5 °F ± 2 °F (+50 °C ± 1 °C and -15 °C ± 1 °C). The tool and components to be crimped shall be soaked at the specified temperatures for 1 hour prior to crimping the components together within 2 minutes after removal from the soak temperatures.

5.10 Wire Barrel Crimp Characteristic Certification

The tool and related dies shall be certified as approved for usage on all components listed in the tool instructions and detail specification. When required by the qualifying activity, the certification will include copies of approvals granted by the activity responsible for component specification and/or component part numbers listed in the tool instruction. This may be in the form of a written approval or documentation demonstrating authorization for the use of the tool with the part numbers listed.

5.11 Tool Application Weight Test

The tool shall be weighed to the nearest 0.1 pound (45 g) on a calibrated scale.

5.12 Tool Maintenance Test

After the life characteristic test (see 5.15), the tool shall be disassembled in accordance with the manufacturer's instruction without special tools to the basic parts noted in the instruction sheet. The maintenance shall then be applied as specified. The tool shall be reassembled then inspected for die gauging (see 5.7.1).

5.13 Shock Test

The tool, with all accessories designed to be continually attached and installed with the heaviest accessory used to crimp a component, shall be loosely placed in a box made of 1/4 inch (6 mm) minimum thickness plywood which has been rigidly fastened to the carriage of a shock test device. The box dimension shall be a cube with sides at a height as to retain the tool being tested plus 4 inches (100 mm) (minimum) longer than the longest length of a fully assembled tool. The same or different boxes are permitted to perform this test on tools of the same or different sizes. The box may be open at the top to facilitate accessibility to the tool. The tool shall be subjected to a shock in accordance with method 213, test condition I of MIL-STD-202. Two shocks shall be applied, one with the termination entrance of the tool facing the bottom of the box and the other with the entrance facing away from the bottom. The tool shall be tested for gaging characteristics. The tools and accessories shall be examined for marking legibility.

5.14 Humidity Test

The tool with accessories attached and all other accessories shall be tested in accordance with method 106 of MIL-STD-202. Subcycles and post testing in the humidity environment shall not be performed. The case, tools, and accessories shall be examined for corrosion, water absorption, and marking legibility.

5.15 Life Characteristics Test

The tool shall be cycled 500 times without a component in the dies. One cycle shall consist of starting from the fully open position to the completed crimp position and returned to the fully open position. The dies combination used to crimp the largest wire barrel shall be installed in the tool. A specified AS7928 component shall then be crimped on the largest specified conductor. The 500 cycles follow by a crimp component shall be repeated ten times. If automated testing is used, the tool shall be mounted such that it can be mechanically actuated at a rate no faster than 12 to 20 cpm. Any unscheduled interruption in the test shall be recorded in the test notes in detail, provided to the qualifying activity, and the test resumed. The tool shall be disassembled and reassembled for maintenance in accordance with 5.12 then tested for tool assembly, tool operation characteristics, crimp operation, high compression force, crimp compression force, and crimp characteristics.

5.16 Corrosion Test

All gages, one basic tool with no accessories attached, and one tool with dies installed and all accessories attached shall be subjected to a salt spray test in accordance with method 101, condition B of MIL-STD-202. The salt solution shall be 5% concentration. Immediately after removal from the chamber, the tool shall be rinsed in running water not warmer than 100 °F ± 5.4 °F (38 °C ± 3 °C) and subsequently dried in a circulating air oven for 12 hours at a temperature of 100 °F ± 5.4 °F (38 °C ± 3 °C). When the storage container is specified, it shall be tested without the tools inserted and with the lid open. The gages, tools, and dies s, and storage container shall be examined for corrosion, marking legibility, and tested tool operation characteristic, and crimp operation.

5.16 Workmanship Examination

Examine the tool, and all accessories for sharp edges, burrs, or other characteristics which might hamper the tool's intended performance or cause physical harm to the operator.

6. ORDERING DATA AND PACKAGING

6.1 Acquisition Information

Unless otherwise specified, product will be supplied to the latest revision in effect at issuance of purchase order.

6.2 Acquisition documents should specify the following:

a. Title, number including revision letter, and date of AS5259 specification.

b. Applicable detail specification number, including revision letter, title, and date.

c. Applicable detail specification part number.

d. Packaging and packing requirements including marking. Tools will be provided in commercial packaging when packaging is not included. Commercial packaging (including unit and intermediate packaging, packing, and marking) shall be in accordance with ASTM D3951.

7. NOTES

7.1 Supersession Information

AS5259 supersedes MIL-C-22909. The part numbers as specified in the detail specification remains unchanged for superseding parts.

7.2 Qualification

With respect to products requiring qualification by the government, awards will be made only for products, which are at the time set for opening of bids, qualified for inclusion in the applicable qualified products list (QPL), whether or not such products have actually been so listed by that date. The attention of the manufacturers is called to these requirements, and manufacturers are urged to arrange to have the products that they propose to offer to the federal government tested for qualification in order that they may be eligible to be awarded contracts for the products delineated by AS5259. Qualification is required for U.S. government procurement.

7.2.1 Supplier (Manufacturer) Identification

For qualification and QPL listing the manufacturer shall have a commercial and government entity (CAGE) code listed in "SAM."

7.2.2 QPL Evaluating Activity

The QPL evaluating activity, for U.S. Department of Defense procurement purposes, is the Naval Air Warfare Center - Aircraft Division (Code AB43300), 48298 Shaw Road BLDG 1461, Patuxent River, MD 20670-1900. Application for qualification tests shall be made in accordance with provisions governing qualification in SD-6.

7.2.3 QPL Publication

The qualifying activity is required to provide a summarized list of all qualified sources on a public accessible electronic site. The summary shall include, but is not limited to, the supplier approved part number and related specification part number, a dedicated approval reference number, a supplier location where purchases may be requested, and the manufacturing location of the component. The suppliers and products qualified to AS5259 are available on the qualifying activity website (http://www.navair.navy.mil/qpl/).