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400 Commonwealth Drive, Warrendale, PA 15096-0001

AEROSPACE STANDARD

SAE AS5457

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Aerospace Standard for Hand-Held Wire Stripper Tools

1. SCOPE:

   This SAE Aerospace Standard (AS) provides technical information for hand-held wire stripper tools used to strip aerospace wires sizes 10 - 30 AWG. The AS includes inspection criteria for the tool and the stripped end of electrical wire.

2. DESCRIPTION OF WIRE STRIPPER TOOLS:

   A quality insulation strip depends upon the configuration of the tool body, the insulation gripper types, and the cutting blade types. The wire stripper tool body shall typically have single-squeeze operation and plastic or cushioned, hand grips for handling ease. The tool shall have wire insulation grips specifically designed to protect the insulation when the insulation slug is being removed. The wire stripper tool shall have a die-type blade design with a counter-bored hole sized to the insulation and an inner cutting hole sized to the conductor. Adjustable wire stops are recommended. A list of typical wire stripper tools commonly used for military wire is provided in Appendix A.

3. DESCRIPTION OF WIRE STRIPPER BLADES:

   The blades of wire stripper tools can have the different profiles. The preferred profile is shown in Figure 1. When the wire stripper tool is closed, the edges of the blades shall be in the same plane and form a cutting circumference whose diameter is greater than the maximum diameter of the conductor of the wire to be stripped.

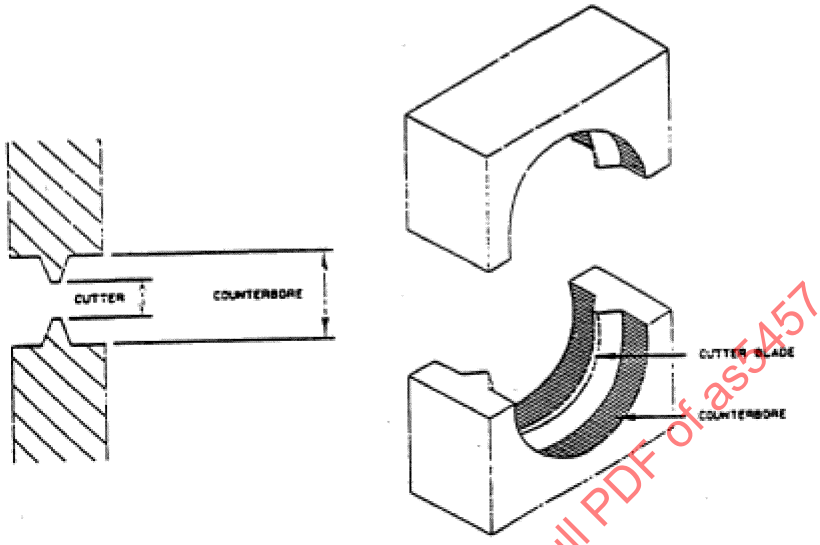

FIGURE 1 - Preferred Wire Stripper Blade Profile

4. IDENTIFICATION OF WIRE STRIPPER TOOLS AND BLADES:

The type of wire that can be stripped shall be permanently marked on the tool or blade when required by a procurement specification. The blade cavities shall be identified to indicate which wire size fits in which cavity. The manufacturer's instruction sheet provided with the tool or blades shall indicate what known wire types maybe used with the tool. The manufacturer's name and part number shall be on the tool and blade, if the blade is replaceable.

5. INSPECTION FOR WIRE STRIPPER TOOLS:

5.1 Stripper Blade Inspections:

The inspection of wire stripper blade is carried out with the aid of measuring gauges, calipers or other means of measurement permitting confirmation that the cavity diameters are in accordance with the dimensions specified in Table 1 with the tool blade in a closed position.

Each blade cavity shall be cylindrical, as shown in Figure 2, however, a slight asymmetry of the two halves of the blade may be acceptable if the blade does not damage the conductor when stripping is performed. The blade defects shown in Figure 3 are not acceptable, and the blade of the wire stripper tool shall be replaced when these defects are discovered. The most effective way to inspect the blade is in a closed position with a light source behind the blade. If light can be seen in the slit between the cutting cavities, the blade should be cleaned and visually checked for imperfections or blade alignment.

TABLE 1 - Allowable Nicked and Broken Strands of Stripped Copper or Copper Alloy Conductor

NUMBER OF STRANDS PER CONDUCTOR*	TOTAL ALLOWABLE NICKED AND BROKEN STRANDS
1 AND 7	NONE NICKED, BROKEN OR SEVERED
19	2 NICKED, NONE BROKEN OR SEVERED
37	4 NICKED, NONE BROKEN OR SEVERED
MORE THAN 37	6 NICKED, NONE BROKEN OR SEVERED

* No nicked or broken strands are permitted for aluminum conductor regardless of the number of conductor strands.

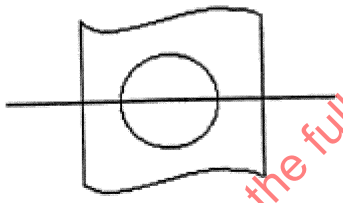

FIGURE 2 - Acceptable Wire Stripper Blade Cavity is Cylindrical and Forms a Complete Perimeter

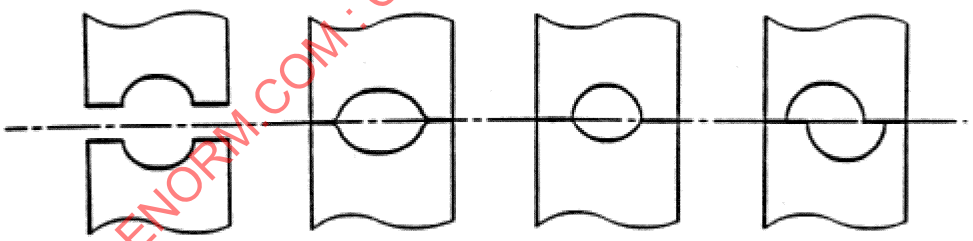

FIGURE 3 - Unacceptable Wire Stripper Blade Cavities Have Asymmetrical Shapes, Do Not Form Complete Perimeters, and Do Not Form Complete Cylinders

5.2 Stripped Wire Procedure and Inspection:

The wire shall be strippable per the manufacturer's instructions. The wire insulation shall smoothly be removed from the conductor with a one-step stripping action.

The conductor strands shall not be nicked or broken beyond the limits established in Table 1. Some scraping or longitudinal scratches are permissible provided the conductor base metal is not exposed when viewed without magnification. Figure 4 defines typical nicked, and scraped conductor characteristics. The conductor shall not become untwisted (see Figure 5) or bird-caged (see Figure 6).

5.3 Insulation Inspection:

The wire insulation shall not be punctured, crushed, or cut by the tool (see Figure 8). The insulation deformation shall not exceed 20% of the insulation thickness. The insulation shall not have gouges, ragged edges, and be neither loose nor frayed. The end of the insulation shall be cut as squarely and cleanly as required to meet any soldering or crimping requirements (see Figure 7).

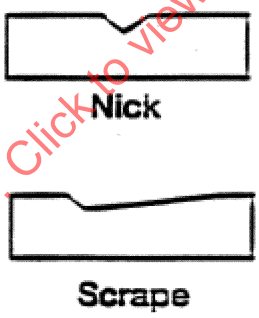

FIGURE 4 - Nicked Versus Scraped Conductor

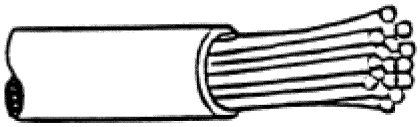

FIGURE 5 - Untwisted Conductor Strands

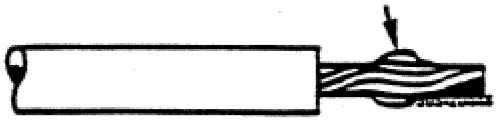

FIGURE 6 - Bird-Caged Conductor Strands

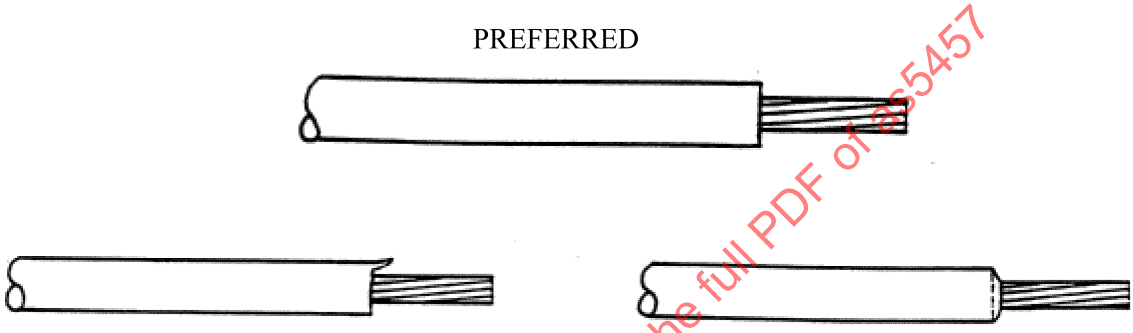

FIGURE 7 - Acceptable Insulation

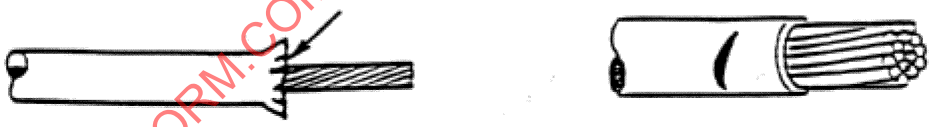

FIGURE 8 - Frayed or Damaged Insulation

5.4 Final Acceptance Criteria:

If the above conditions noted in 5.2 exist, cut off the stripped portion of the wire squarely and start the stripping procedure again.

If only untwisting or bird caging occurs due to human error, correct and reshape conductor strands by twisting the strands in the same direction on the normal lay of the wire. It is recommended that the conductor only to be twisted by hand. If pliers are required due to the size of the strands, caution shall be taken to prevent damage to the conductor. The conductor shall not be over twisted. For solder applications, the bare fingers cannot be used. Caution shall always be taken not to contaminate the strands. Excess strands of insulation may be removed.

5.5 Strip Length Inspections:

Length of the strip is dependent upon the termination application. Multiple stripping actions may be needed to remove the insulation without damaging the conductor. It is recommended the last insulation slug not be removed until immediately prior to termination.

For termination to contacts crimped by indenters or soldered, the length of stripped portion of the conductor shall be at least long enough to reach the bottom of the crimp barrel or beyond the inspection hole. For termination to terminals or splices crimped by form dies, the length of the stripped portion of the conductor shall be long enough to reach the conductor stop or extend beyond the crimp barrel.

The length of the stripped portion of the conductor must also include the maximum exposed length of conductor between the insulation and the barrel. The length of the exposed area is application sensitive.

6. JURISDICTION:

It is the responsibility of the wire user to determine, if a specific tool type can be used to properly strip a specific wire construction. The AS does not endorse any particular tool, but only lists what is generally used by the aerospace industry. This AS is prepared under the jurisdiction of the AE-8 committee with technical support of the lead subcommittee AE-8C2. Proposed changes to this AS should be sent in writing to:

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