

REAFFIRMED

12/31/5795 Cancelled 05-95

SAE The Engineering
Resource For
Advancing Mobility®

400 COMMONWEALTH DRIVE, WARRENDALE, PA 15096

**AEROSPACE
RECOMMENDED
PRACTICE**

ARP 1877

Issued 7-1-85
Revised

FABRICATION OF FORM-FIT POLYURETHANE FOAM HELMET LINERS

1. SCOPE:

1.1 Form: This specification describes the materials, equipment, and procedures used in fabricating foam-in-place flight helmet liners.

2. APPLICABLE DOCUMENTS: The following publications form a part of this recommended practice to the extent specified herein. The latest issue of Aerospace Material Specifications shall apply. The applicable issue of other documents shall be as specified in AMS 2350.

2.1 SAE Publications: Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096.

2.1.1 Aerospace Material Specifications:

AMS 2350 - Standards and Test Methods

AMS 3574 - Polyurethane, Foam-in-Place, Rigid, Closed Cell, for Helmet Liners

2.2 ASTM Publications: Available from American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.

ASTM D1662 - Apparent Density of Rigid Cellular Plastics

3. PROCESS RECOMMENDATIONS:

3.1 Equipment:

3.1.1 Medium size, KMU-439/P, Liner Mold (See 5.2).

3.1.2 Helmet mold set consisting of a teflon coated mold shell, adjusting ring, spacer cap, seal ring, ejector tool assembly, and mold case.

3.2 Procedure:

SAE Technical Board Rules provide that: "This report is published by SAE to advance the state of technical and engineering sciences. The use of this report is entirely voluntary, and its applicability and suitability for any particular use, including any patent infringement arising therefrom, is the sole responsibility of the user."

SAE reviews each technical report at least every five years at which time it may be reaffirmed, revised, or cancelled. SAE invites your written comments and suggestions.

3.2.1 Fitting the Mold:

3.2.1.1 Step 1:

- 3.2.1.1.1 Place the adjusting ring over a suitable head form with strap adjusting screws labeled "ADJ" and "LOCK" located at the back side of the head. The ring shall be positioned so that it covers the eyes.
- 3.2.1.1.2 The position of the ring is controlled by the strap. To adjust the strap, slightly loosen the screw marked "LOCK" and turn the screw marked "ADJ" to change the position of the adjusting ring. When the ring is in the proper position, finger tighten the locking screw.
- 3.2.1.1.3 Place the teflon-coated mold shell on the adjusting ring with the top of the shell located approximately 1.25 in. (32 mm) above the top of the head.
- 3.2.1.1.4 Adjust, if necessary, using the strap. Remove the mold shell and place the release-agent-coated spacer cap (See 5.3) on the head form, over the straps.
- 3.2.1.1.5 The front of the cap is indicated by the point where the seams join together on the inside surface.
- 3.2.1.1.6 Pull the cap down tightly over the head and fasten under the chin using the velcro fastener. Remove all air trapped under the spacer cap, smoothing the cap by pressing with the hands, starting at the center of the top of the head form and then out and down in all directions.
- 3.2.1.1.7 Recheck the adjusting ring, making sure that it is still centered.

3.2.1.2 Step 2:

- 3.2.1.2.1 Tighten the four adjusting screws in the adjusting ring so that the centering bars exert uniformly light pressure against the spacer cap and head form.
- 3.2.1.2.2 The adjusting ring should now be approximately equally spaced from the spacer cap at all points. This step is necessary to prevent movement of the adjusting ring during the foaming process.

3.2.1.3 Step 3:

- 3.2.1.3.1 Place the release-agent-coated seal ring over the spacer cap, pulling it down evenly to the adjusting ring. Care must be exercised not to disturb the centering of the adjusting ring.
- 3.2.1.3.2 The seal ring may be placed with either surface facing upward, but the narrow end of the seal ring shall be located at the front of the head form.