

AERONAUTICAL MATERIAL SPECIFICATION

Society of Automotive Engineers, Inc.
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AMS 3720

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Revised

PAPER HONEYCOMB (60 lb Paper)

1. ACKNOWLEDGMENT: A vendor shall mention this specification number in all quotations and when acknowledging purchase orders.
2. FORM: Paper base honeycomb core material having a cell size of 0.330 or 0.440 inch. Unless otherwise specified, cell size shall be 0.440 inch.
3. APPLICATION: Primarily for use as a core in sandwich construction of light weight partitions, space fillers, and non-structural parts. This material is not intended for aircraft structural or exterior applications.
4. MATERIAL: Shall consist of Kraft paper, suitably bonded together along the applied glue lines in such a manner as to form a hexagonal, cellular structure after impregnating with a thermosetting phenolic type laminating resin and thoroughly curing by the application of heat.
 - 4.1 Paper: Shall be a rosin sized, 100% unbleached sulfate fiber No. 2 Kraft wrapping paper meeting the following requirements:
 - 4.1.1 Physical Properties:

Ream Weight (500 sheets 24 x 36 in.), lb	60 ± 3	
Average Bursting Strength, lb, min	48	ASTM D774-46
Thickness, in.	0.0050 - 0.0060	
 - 4.1.2 Acidity: The pH of the paper shall be 7.0 ± 1.0.
 - 4.2 Impregnating Resins: Shall not adversely affect the strength or life of the paper and shall contain no addition agents which will adversely affect the strength or life of either the glue line or paper.
5. TECHNICAL REQUIREMENTS:
 - 5.1 General:
 - 5.1.1 Alignment: Unless otherwise agreed upon by purchaser and vendor, the matching flats of each cell shall be accurately aligned during the bonding operation so that 100% of the available bonding width of each flat is in contact, and no block shall have any corrugations misaligned or partially overlapping. When agreed upon, the material shall contain not more than one misplaced sheet per inch of length. The overlap of such misplaced sheet shall not exceed 25% of the available matching flat area.

Section 7C of the SAE Technical Board rules provides that: "All technical reports, including standards approved and practices recommended, are advisory only. Their use by anyone engaged in industry or trade is entirely voluntary. There is no agreement to adhere to any SAE standard or recommended practice, and no commitment to conform to or be guided by any technical report. In formulating and approving technical reports, the Board and its Committees will not investigate or consider patents which may apply to the subject matter. Prospective users of the report are responsible for protecting themselves against liability for infringement of patents."

- 5.1.2 Bonding: The glue lines shall be completely bonded over their entire width. There shall be not more than one unbonded glue line in any 10 in. square area of the sheet after slicing or band-sawing the sheet into slabs.
- 5.1.3 Trimming: The honeycomb shall be neatly trimmed so that the trimmed edges exhibit a uniform structure free from trim scraps. The faces shall be sawed, sanded or otherwise trimmed to provide parallel surfaces suitable for bonding.
- 5.1.4 Impregnation: The impregnating resin shall completely cover the honeycomb in a uniformly thin film free from starved areas. Occasional bubbles or pinholes will not be cause for rejection.
- 5.1.5 Corrosion: The product shall not have a corrosive effect on other materials when exposed to conditions normally encountered in service. Discoloration of metal shall not be considered objectionable.

5.2 Physical Properties:

Nominal Cell Dimension, Per- pendicular to Match- ing Flats Inch (a)	Apparent Density lb per cu ft	Compression Strength psi, min	
		Room Temp.	180 F
0.330	2.0 - 2.4	100	100
0.440	1.5 - 1.8	80	80

(a) Average of 10 adjacent cells.

- 5.2.1 Compression Strength: The honeycomb shall be capable of meeting the ultimate compression strength flatwise (parallel to the direction of the cells) shown above after being conditioned at a temperature of $77\text{ F} \pm 2$ and a relative humidity of $50\% \pm 5$ for 16 hours. At least 5 specimens shall be tested, each specimen to be $3 \times 3 \times 1$ in. with the 1 in. dimension parallel to the direction of the cell axes. The faces shall be bonded to parallel flat panels prior to testing. The 1 in. dimension shall be accurate to within 0.010 inch. The compression load shall be applied evenly over the 9 sq in. area at a rate of head travel not exceeding 0.006 in. per minute. When production thicknesses under 1 in. are tested, the compression strength requirements shall be 110% of the values shown in 5.2, unless otherwise agreed upon.
- 5.3 Bond Area: The width of the cured glue line shall be uniform within 0.015 in. located $0.986 \text{ in.} \pm 0.010$ apart on centers across a flattened sheet, unless use of preimpregnated paper is allowed, in which instance dimension and location of the bonded area shall be as agreed upon by purchaser and vendor.
6. QUALITY: The cells of each block shall be uniform in appearance and shall be accurately bonded to adjacent cells to form a sheet of uniform density.

7. TOLERANCES: Unless otherwise specified, the following tolerances apply:

7.1	Dimension	Tolerance, Inch	
		Plus	Minus
	Width (Parallel to Plane of Paper)	0.5	0.0
	Length (Perpendicular to Matching Flat)	2.0	0.0
	Thickness (Parallel to Cell Axes)	0.010	0.010
	Cell Size (Perpendicular to Matching Flat)	0.060	0.060

7.1.1 The faces of the sheet perpendicular to the cell axes may be produced by shearing, sawing or sanding at the option of the supplier, unless otherwise agreed upon by purchaser and vendor. Thickness tolerances of sheared or sawed faces shall be measured by means of a fixture that will impose a load of 7 psi $\pm$ 1 on the honeycomb.

7.2 Flatness: The faces of the honeycomb perpendicular to the cell axes when measured in any direction across the sheet shall be flat to within 1/64 in. in 12 in., using not more than 8 psi superimposed load.

8. REPORTS:

8.1 Unless otherwise specified, the vendor of the product shall furnish with each shipment three copies of a report stating that the product meets the requirements of this specification. This report shall include the purchase order number, material specification number, cell size, and quantity.

8.2 Unless otherwise specified, the vendor of finished or semi-finished parts shall furnish with each shipment three copies of a report showing the purchase order number, material specification number, cell size, contractor or other direct supplier of material, part number, and quantity. When material for making parts is produced or purchased by the parts vendor, that vendor shall inspect each lot of material to determine conformance to the requirements of this specification, and shall include in the report a statement that the material conforms, or shall include copies of laboratory reports showing the results of tests to determine conformance.

9. PACKAGING:

9.1 Packaging shall be accomplished in such a manner as to ensure that the sheets, during shipment and storage, will not be permanently distorted, and will be protected against damage from exposure to weather or any normal hazard.

9.2 Each package of sheets shall be permanently and legibly marked to give the following information:

PAPER HONEYCOMB (60 LB PAPER)
 AMS 3720
 CELL SIZE _____
 QUANTITY _____
 PURCHASE ORDER _____
 MANUFACTURER'S IDENTIFICATION _____
 DATE OF MANUFACTURE _____