

NATIONAL AEROSPACE STANDARD

AEROSPACE INDUSTRIES ASSOCIATION OF AMERICA, INC., 1725 DE SALES STREET, N. W., WASHINGTON 6, D. C.

FED SUP CLASS
5680COMPRESSIVE STRENGTH TEST (EDGEWISE)
FOR SANDWICH CONSTRUCTIONS

1.0 PURPOSE, SCOPE, AND USAGE

1.1 PURPOSE

The purpose of this procedure is to provide a standardized method of edgewise compressive testing of sandwich construction materials such as generally used in radar antenna housings (radomes).

1.2 SCOPE

This method of test covers a procedure for determining compressive properties of sandwich constructions in a direction parallel to the plane of a sheet of sandwich.

1.3 USAGE

This procedure shall be used when called for in specifications, purchase orders, or contracts. It is intended, primarily, for evaluation of sandwich construction used in aircraft and missile structures.

2.0 TESTING APPARATUS AND TEST CONDITIONS

2.1 TESTING APPARATUS

Unless otherwise specified, properties shall be determined in any standard type of testing equipment meeting the requirements specified herein and properly calibrated and accurate to one percent in the range used.

2.2 TEST CONDITIONS

The temperature and humidity conditions during test depend on the purpose of the particular tests under consideration and shall be as stipulated in the procurement specification for the material. Unless otherwise specified, tests shall be made at room temperature. Normal or room temperature tests shall be conducted at 73 ± 2 F. (23 ± 1 C.) and 50 ± 4 percent relative humidity. The tests should preferably be made in a room under the same conditions.

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Index of Current Sheets

Sheet	Revision	Sheet	Revision
1	1	4	1
2	1	5	1
3	1	6	1

CUSTODIAN: Materials and Structures Committee

PROCUREMENT
SPECIFICATION

None

TITLE

**COMPRESSIVE STRENGTH TEST
(EDGEWISE) FOR SANDWICH CONSTRUCTIONS**

CLASSIFICATION
Standard Practice

NAS 1639

Sheet 1 of 6

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3.0 TEST SPECIMENS

3.1 Test material shall be prepared in flat panels of suitable size that test specimens can be cut from the panels. Such panels shall be fabricated, treated, and cured according to the same procedures to be used on production contoured or flat sandwich panels. The thickness of the panels shall be identical to the thickness of the production panels.

3.2 The test specimens shall be rectangular in cross section. Edgewise compression specimens of sandwich construction shall be at least 2 inches wide, but not less than twice the sandwich thickness, nor less than the width of two complete core cells. The unsupported specimen length (dimension parallel to direction of applied load) shall be not greater than eight times the sandwich thickness.

Care shall be taken in preparing the test specimens to insure smooth end surfaces, free of burrs. The loaded ends shall be parallel within ± 0.0005 inch. The exterior dimensions of the specimen shall be measured to at least the nearest 0.5 percent. The face thicknesses shall be measured to ± 0.001 inch.

3.3 The orientation of fibers in the faces and the orientation of bidirectional-type core materials with respect to the test specimen depend on the purpose of the particular tests under consideration. In general, however, for comparison purposes the fibers in the faces shall run parallel and perpendicular to the length of the specimen; and in case of honeycomb core materials, the ribbon directions shall run parallel to the length of the specimen. Tolerances of parallelism are not critical, but prudence and care shall be exercised in cutting specimens.

3.4 The facings of the sandwich shall be supported against lateral buckling at the specimen ends. This can be done by clamps of rectangular steel bars fastened together so as to clamp the specimen lightly between them. The clamping pressure is not in itself so critical as the means taken to insure that each specimen is clamped in the same manner. A suggested procedure is use of a torque wrench to tighten the clamp bolts to the same torque each test. The cross-sectional dimensions of each of these bars shall preferably be not less than the sandwich thickness; shall not be less than four times the facing thickness; nor less than $1/4$ " in any case. End support may also be obtained by casting the ends of the specimens in a resin or in plaster of Paris or other suitable molding material. The casting material shall not extend into the sandwich more than the thickness of the specimen.

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