Designation: C 274 – 99

Standard Terminology of Structural Sandwich Constructions[1]

This standard is issued under the fixed designation C 274; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This terminology covers terms necessary for a basic uniform understanding and usage of the language peculiar to structural sandwich constructions. The simplest structural sandwich is a three layered construction formed by bonding a thin layer (facing) to each side of a thick layer (core).

2. Referenced Documents

2.1 *ASTM Standards:*

D 907 Terminology of Adhesives[2]

3. Terminology

adhesive, n—a substance capable of holding materials together by surface attachment.

DISCUSSION—This definition was established in Terminology D 907.

bending stiffness, n—the sandwich property which resists bending deflections. D=EI; the facing modulus times the panel moment of inertia.

co-curing, n—curing a composite laminate and simultaneously bonding it to the sandwich core.

co-fab, n—fabrication process where close-outs and inserts are bonded into the panel the same time the facings are bonded to the core.

core, n—a centrally located layer of a sandwich construction, usually low density, which separates and stabilizes the facings and transmits shear between the facings and provides most of the shear rigidity of the construction.

doublers, n—an extra piece of facing attached to strength or stiffen the panel or to distribute the load more widely to the core.

edge close-outs, n—members placed around the panel sides to protect the sandwich from damage or to attach the panel to a support or another panel.

facing delamination, n—where the facing becomes disbonded from the core.

face dimpling, n—buckling of the compressive facing into the individual cells of the honeycomb core due to compressive loading or the prepreg facing sagging into the individual honeycomb cells during cocure.

face wrinkling, n—buckling of the compressive facing into or away from the core. This progresses the width of the panel and causes failure.

facing, n—the outermost layer or composite component of a sandwich construction, generally thin and of high density, which resists most of the edgewise loads and flatwise bending moments: synonymous with face, skin and facesheet.

inplane loads, n—loads which are parallel to the facings.

inserts, n—apparatus placed into the sandwich for attaching items: synonymous with hard points.

post-fab, n—fabrication process where close-outs and inserts are attached or put into the panel after the facings are bonded to the core.

shear crimping, n—buckling of the compressive facing due to low core shear modulus. Usually causes the core to fail in shear at the crimp.

shear rigidity, n—the sandwich property which resists shear distortions: synonymous with shear stiffness. U=hG; the core thickness (approximate) times the core shear modulus.

structural sandwich construction, n—a laminar construction comprising a combination or alternating dissimilar simple or composite materials assembled and intimately fixed in relation to each other so as to use the properties of each to attain specific structural advantages for the whole assembly.

transverse loads, n—loads which are perpendicular to the facings: synonymous with flatwise load.

4. Keywords

4.1 core; facing; loads; rigidity; sandwich; sandwich construction; stiffness

[1] This test method is under the jurisdiction of ASTM Committee D-30 on Composite Materials and is the direct responsibility of Subcommittee D30.09 on Sandwich Construction.

Current edition approved Oct. 10, 1999. Published February 2000. Originally published as C 274 – 51 T. Last previous edition C 274 –94.

[2] *Annual Book of ASTM Standards*, Vol 15.06.