



Stephen Tsai

Professor (Research) of Aeronautics and Astronautics, Emeritus

 Curriculum Vitae available Online

CONTACT INFORMATION

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Bio

BIO

Professor Tsai's research interest is in the development of design methodology of composite materials and structures. As an emerging technology, composite materials offer unique performances for structures that combine light weight with durability. Keys to the successful utilization of composite materials are predictability in performance and cost effective design of anisotropic, laminated structures. Current emphasis is placed on the understanding of failure modes, and computer simulation for design and cost estimation.

ACADEMIC APPOINTMENTS

- Emeritus Faculty, Acad Council, Aeronautics and Astronautics
- Member, Cardiovascular Institute

BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS

- Member, National Academy of Engineering (1995 - present)

Publications

PUBLICATIONS

- **Buckling optimization of Double-Double (DD) laminates with gradual thickness tapering** *COMPOSITE STRUCTURES*
Wang, D., Su, Z., Narayanaswamy, S., Tsai, S. W. L.
2025; 351
- **Topology optimization of Double-Double (DD) composite laminates considering stress control** *COMPUTER METHODS IN APPLIED MECHANICS AND ENGINEERING*
Wang, Y., Wang, D., Zhong, Y., Li, S., Tsai, S. W.
2023; 414
- **Defining the Design Space for Double-Double Laminates by Considering Homogenization Criterion** *AIAA JOURNAL*
Zhao, K., Kennedy, D., Miravete, A., Tsai, S. W., Featherston, C. A., Liu, X.
2023
- **Double-Double: New Family of Composite Laminates** *AIAA JOURNAL*

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- Tsai, S. W.
2021; 59 (11): 4293-4305
- **Design of laminates by a novel "double-double" layup** *THIN-WALLED STRUCTURES*
Vermes, B., Tsai, S. W., Massard, T., Springer, G. S., Czigany, T.
2021; 165
 - **Application of the Tsai's modulus and double-double concepts to the definition of a new affordable design approach for composite laminates** *COMPOSITE STRUCTURES*
Vermes, B., Tsai, S. W., Riccio, A., Di Caprio, F., Roy, S.
2021; 259
 - **D and DD-drop layup optimization of aircraft wing panels under multi-load case design environment** *COMPOSITE STRUCTURES*
Shrivastava, S., Sharma, N., Tsai, S. W., Mohite, P. M.
2020; 248
 - **A novel invariant-based design approach to carbon fiber reinforced laminates** *COMPOSITE STRUCTURES*
Melo, J. D., Bi, J., Tsai, S. W.
2017; 159: 44-52
 - **A trace-based approach to design for manufacturing of composite laminates** *JOURNAL OF REINFORCED PLASTICS AND COMPOSITES*
Tsai, S. W., Arreiro, A., Melo, J. D.
2016; 35 (7): 589-600
 - **A unit circle failure criterion for carbon fiber reinforced polymer composites** *COMPOSITES SCIENCE AND TECHNOLOGY*
Tsai, S. W., Melo, J. D.
2016; 123: 71-78
 - **Trace-based stiffness for a universal design of carbon-fiber reinforced composite structures** *COMPOSITES SCIENCE AND TECHNOLOGY*
Tsai, S. W., Sihn, S., Melo, J. D.
2015; 118: 23-30
 - **An invariant-based theory of composites** *COMPOSITES SCIENCE AND TECHNOLOGY*
Tsai, S. W., Melo, J. D.
2014; 100: 237-243
 - **Smart cure of thick composite filament wound structures to minimize the development of residual stresses** *EUROMECH 453 Colloquium on Internal Stresses in Polymer Composite Processing and Service Life*
Lee, D. H., Kim, S. K., Lee, W. I., Ha, S. K., Tsai, S. W.
ELSEVIER SCI LTD.2006: 530-37
 - **Three decades of composites activities at US Air Force Materials Laboratory** *COMPOSITES SCIENCE AND TECHNOLOGY*
Tsai, S. W.
2005; 65 (15-16): 2295-2299
 - **Time- and temperature-dependent failures of a metal-to-composites bonded joint with PMMA adhesive material** *JOURNAL OF COMPOSITE MATERIALS*
Sihn, S., Miyano, Y., Nakada, M., Tsai, S. W.
2003; 37 (1): 35-54
 - **A progressive quadratic failure criterion, part B** *COMPOSITES SCIENCE AND TECHNOLOGY*
Kuraishi, A., Tsai, S. W., Liu, K. K.
2002; 62 (12-13): 1683-1695
 - **PECVD silicon carbide as a chemically resistant material for micromachined transducers** *9th International Conference on Solid-State Sensors and Actuators*
Flannery, A. F., Mourlas, N. J., Storment, C. W., Tsai, S., Tan, S. H., Heck, J., Monk, D., Kim, T., Gogoi, B., Kovacs, G. T.
ELSEVIER SCIENCE SA.1998: 48-55
 - **A progressive quadratic failure criterion for a laminate** *COMPOSITES SCIENCE AND TECHNOLOGY*
Liu, K. S., Tsai, S. W.

1998; 58 (7): 1023-1032

● **Obituary: Late Professor Tsuyoshi Hayashi** *ADVANCED COMPOSITE MATERIALS*

Hoff, R., Springer, G. S., Tsai, S. W.

1998; 7 (3): 217-218

● **Analysis and behavior of grid structures** *COMPOSITES SCIENCE AND TECHNOLOGY*

Huybrechts, S., Tsai, S. W.

1996; 56 (9): 1001-1015

● **SCHOOLING TAIWAN WOMEN - EDUCATIONAL-ATTAINMENT IN THE MID-20TH CENTURY** *Meeting of the Research-Committee-on-Social-Stratification of the International-Sociological-Association*

Tsai, S. L., Gates, H., Chiu, H. Y.

AMER SOCIOLOGICAL ASSOC.1994: 243-63