

*Holcombe Department of Electrical and Computer Engineering
Lecturer Presentation*

**The Power Factor Triangle and its Application to Power
Factor Correction**

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Abstract

This sample lecture discusses the AC Power factor Triangle and its application to power factor correction in an AC power distribution circuit. The topics covered include inductive and capacitive impedances, phasor plot diagrams, phase angles, real, reactive and apparent AC power and the use of the power triangle to implement power factor correction. In closing, a sample calculation that illustrates the power factor triangle calculations required to improve the power factor for a single phase AC induction motor are presented to reinforce the above concepts.

Biography of Speaker

Thomas M. (Tom) Bilodeau received his BS, MS and PhD degrees from the University of Buffalo in 1982, 1985 and 1987, respectively. Tom performed his doctoral research in the area of electrical insulation design and testing, publishing his work at the IEEE Transactions on Insulation, Instrumentation and Measurement, pulse Power Conference and Dielectric and Insulation Symposium. After graduation, Tom was employed from 1987 to 1993 as an Electronics Engineer for the US Air Force at Griffiss AFB in Rome, NY, at the Microwave Radar Technology Directorate. Tom performed laboratory research into the effects of applied electrical overstress (including static discharge, microwave radiation and lightning) on the reliability of GaAs microwave devices, publishing his findings at the Electrical Overstress Symposium and Government Microwaves Conferences.

Tom was then employed at Mohawk ElectroTechniques in Barneveld, NY from 1993 to 2003, where he worked as a magnetics and power electronics engineer, designing switchmode power supplies, 60 Hz AC transformers high frequency ferrite core transformers / inductors and RF tuning circuitry for military communications and radar systems. Tom then joined the State University of New York at Canton as an Electrical Engineering Technology instructor from 2003 to 2006, where he taught courses on solid state electronics, electric machinery and power systems. Tom also co-authored a SUNY Canton NSF grant proposal that established SUNY Canton as the first college in New York to offer a BS degree in Alternative Energy Technology.

After leaving SUNY Canton, Tom was employed again as an electrical engineer at Mohawk Electrotechniques and continued to design switch mode power supplies and high frequency ferrite core transformers and inductors for microwave radar and communications equipment. In addition, Tom also worked on several novel field coil and electronic drive circuit designs for a new class of switched reluctance motor, in collaboration with the Sunburst Electronics Company.

Finally, Tom was employed as a visiting professor at Georgia Southern University from August 2013 to June 2017; where he taught undergraduate courses on C/C++ programming; Matlab applications, electrical circuits, solid state electronics and digital circuits (including both lecture and laboratory sections of these courses). Since June 2017, Tom has been working as part of a data base consultation team in Tampa, FL.