3:00-4:00pm, Friday, October 6, 2017
1100 Patrick F Taylor Hall Conference Room

Trends in Power Ultrasonic Manufacturing Processes

by Karl Graff*

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The use of intense levels of ultrasonic energy – aka 'power ultrasonics' is finding increasing applications in manufacturing processes. Operating in the 20kHz to 100kHz frequency range, and at power levels of 100's to 1000's of Watts, expanding power ultrasonic (PU) applications include welding, additive manufacturing, the casting and forming of metals and the rapidly expanding field of ultrasonic machining (the application of PU to traditional machine tool processes). Discussion will highlight the principles of PU, including physical effects on materials, key manufacturing applications – and note several 'green' technologies that are emerging. Fundamental research challenges in PU processes will be identified.

Dr. Graff obtained his BS and MS degree from Purdue University and PhD in Theoretical and Applied Mechanics from Cornell University. Dr. Graff served on the engineering faculty of The Ohio State University for many years, including serving as chair of the Department of Welding Engineering while collaborating with the renowned developer, inventor, and teacher of ultrasonics, Dr. Robert C. McMaster. Dr. Graff led the effort to found EWI and was the company's executive director from 1987-2000. He oversaw EWI's growth from a small startup to a world-leading organization in materials joining and allied manufacturing technologies. Since 2000, he has continued research in high power ultrasonics in transducers, soldering/brazing, welding, additive manufacturing, machining and forming. He is an authoriÜ ₴ – t ₴ – ḍ sg a