

# 2005 Shot Peeners of the Year

Congratulations to **Marsha Tufft** and **Helmut Wohlfahrt**, our 2005 Shot Peeners of the Year. Ms. Tufft was chosen in honor of the thesis she authored while working at GE. It is a very comprehensive investigation of effects and influences of shot peening titled: Development of a Fracture Mechanics/Threshold Behaviour Model to Assess the Effects of Competing Mechanisms Induced by Shot Peening on Cyclic Life of a Nickel-base Superalloy, Rene 88Dt. Prof. Dr. Wohlfahrt is a member of the International Scientific Committee on Shot Peening and has been a driving force in coordinating and guiding the growth of the triennial International Conferences on Shot Peening. The following biographies will highlight the achievements of these important contributors to both the scientific and industrial components of shot peening.



**Marsha Tufft** graduated with a B.S. in Mechanical Engineering from Purdue University in 1981. She joined GE Aircraft Engines in Cincinnati, Ohio in their Engineering Development Program where she earned her M.S. in Aerospace Engineering from the University of Cincinnati in 1984. At GEAE, she has worked in Commercial, Military and Marine & Industrial Life Management groups as well as Life Methods. It was while working in the CFM56 Life Management group in 1984 that she was first exposed to the shot peening process, and this experience later contributed to her choice of shot peening as the focus of her PhD dissertation. While working in Life Methods, she earned her PhD in Materials Engineering from the University of Dayton in 1997. Her dissertation, "Development of a Fracture Mechanics/Threshold Behavior Model to Assess the Effects of Competing Mechanisms Induced by Shot Peening on Cyclic Life of a Nickel-base Superalloy, Rene' 88DT" focused on understanding and predicting the onset of peening damage, as well as the resulting life impact. During this time, Ms. Tufft gained a strong appreciation for the need for improved process control and greater rigor in establishing Almen intensity by regression analysis of saturation curve data, and the inherent difficulties of establishing a robust definition for 100% coverage. Her work also identified a clear value for velocity measurements for process control. Her current interest is in better understanding the mechanisms that result in fatigue life benefit, as well as the effect of thermal exposure and cyclic loading on life capability, the effect of re-peening after cyclic usage, as well as championing more precise/robust documentation of shot peening conditions, particularly in technical literature.

**Prof. Dr. -Ing. Helmut Wohlfahrt** began his college education in 1955 as student of Mechanical Engineering at the Technische Hochschule Stuttgart. He completed his Diploma thesis at the well-known Max-Planck-Institute for Materials Research in Stuttgart. The diploma thesis led Prof. Dr. Wohlfahrt in the direction of materials science. Proceeding in this direction, he gathered experience on heat treatment techniques for metals at an institute in Bremen (1964-1966) and changed in 1966 to the Institute for materials science and engineering at the University of Karlsruhe.



In 1966-1979, Prof. Dr. Wohlfahrt was a Scientific Assistant at the Institute for materials science and engineering at the University of Karlsruhe. He completed his doctoral thesis at this institute under the leadership of Prof. Dr. E. Macherauch. He investigated the influence of residual stresses due to different heat treatments on the fatigue behaviour of steels and continued with research projects on the effects of residual stresses due to machining and eventually also due to shot peening.

Since 1979, Prof. Dr. Wohlfahrt has been the Professor and Chair of materials technology and welding techniques at the University of Kassel. The main theme of research topics during his time in Kassel was "techniques for fatigue strength improvement of metals, structural components and welded joints" including heat treatments, machining, modern welding technologies and especially shot peening.

As a consequence of his shot peening research, Prof. Dr. Wohlfahrt got in contact with the international shot peening community by attending the first meeting Dr. Niku-Lari organized in Las Vegas in 1980. Prof. Dr. Wohlfahrt became a member of the International Scientific Committee on Shot Peening and participated in the 1st International Conference on Shot Peening 1981 in Paris, and with one exception, participated in all following conferences. During the Shot Peening Conference in Chicago in 1984, he became the Chairman of the International Scientific Committee on Shot Peening and initiated the formation of a German technical committee on "Material's Treatment by Shot Peening" together with the DGM (Deutsche Gesellschaft für Metallkunde). This committee was the basis for organizing the 3rd International Conference on Shot Peening in Garmisch-Partenkirchen/Germany in 1987, which he chaired.

Since 1991, Prof. Dr. Wohlfahrt has been the Professor and Chair of welding techniques at the Welding Institute of the Technical University of Braunschweig. The research activities in this position have been extended to a number of welding specific themes, but the significance of shot peening for welded joints and structures was still a matter of research projects. The total number of his publications increased to more than 300 during this time.

In October 2002, his successor took over the Chair at the institute in Braunschweig. Prof. Dr. Wohlfahrt now lives as a pensioner near Karlsruhe at the north end of the Black Forrest. He enjoys traveling and is still active with tasks in connection with shot peening courses and also in the German Welding Society and in the International Institute of Welding (IIW), from which he received the Arthur Smith Award last year.