

Overview

The symposium “Characterization and Properties of Ultra-High Molecular Weight Polyethylene (UHMWPE)” was held on 19 Nov. 1996 in New Orleans, Louisiana and was sponsored by ASTM F4 on Medical and Surgical Materials and Devices. This symposium, like many of its predecessors, provided a forum for presentations and discussions of issues critical to the understanding of ultra-high molecular weight polyethylene (UHMWPE) as used in medical and surgical devices.

Since its initial use for articular surfaces in hip and knee arthroplasties in the 1960s, there has been a continuous covey of research activities and publications on its properties and performance. Although this material has now been refined to the point that total hip and knee arthroplasties commonly function well clinically for ten, fifteen, or twenty years or more, the need still exists to better understand the material on a micro- as well as a macroscale. Some of the topics that have received particular attention most recently are: weak simulators that more closely mimic in vivo wear rates, wear patterns, and wear debris morphology, relationships between the material’s consolidation quality and its clinical performance, consequences of various packaging and sterilization techniques on its properties and performance, and the effects of various post-consolidation techniques on its properties and performance.

The collection of eleven papers published in this volume has been grouped into three major categories. Some papers could have been placed in more than one category; in these cases an arbitrary decision was made. The three main categories are: Properties and Characteristics of UHMWPE, Morphology of UHMWPE, and Sterilization and Wear of UHMWPE.

This collection of papers should provide the reader with some of the very latest information on research into UHMWPE and give a general flavor of the kinds of topics currently thought to be critical to a more complete understanding of this material. The symposium committee gratefully acknowledges the efforts of the authors and ASTM personnel that have made this publication possible.

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