Title: A Comparison Between Engineered Polymer PEEK and Metal. Why is Plastic Better?

Abstract: Polyether-ether-ketone (PEEK) is a high-performance engineered polymer that has one of the highest strength-to-weight ratios of any thermoplastic, and has excellent heat tolerance. PEEK can be used as an alternative to other materials, including glass, steel, aluminum, and other polymers. The material's strength is complemented by its high purity and lubricity for challenging applications. This rigid plastic is considered one of the world's highest performing materials of its kind. PEEK's significant advantages as a material science solution are creating new breakthroughs in many different markets. Many metal parts are being replaced by PEEK, enabling applications to have maximum design innovation with flexibility, while minimizing weight and costs for systems. In analytical applications, the purity, high burst pressure, and chemical resistance of PEEK ensure that PEEK tubing has the ability to withstand the pressures required for critical lab work without contaminating the results. In a biomedical environment, PEEK can be exposed to sterilization procedures such as autoclaving and gamma irradiation as well as with its biocompatibility to human bodies.

Dr. Raja Izamshah, Associate Professor, Er.(H), Dr. Raja Izamshah serves more than 15 years both in academic and research in the Faculty of Manufacturing Engineering, Universiti Teknikal Malaysia Melaka. He received his BE degree from Universiti Teknologi MARA, Malaysia, MSc. degree from University of Birmingham, UK and PhD in Manufacturing Engineering from RMIT University, Australia. He is also a visiting professor at Tokushima University, Japan. He is a registered Chartered Engineer and member of Institute of Mechanical Engineering (IMechE), United Kingdom. He has published more than 130 technical research papers and has been awarded 2012 Thatcher Bros Prize from Institute of Mechanical Engineering (IMechE), United Kingdom in the field of manufacturing industries and mechanical engineering. He has received a total of 36 awards in both academic and innovation and holds two innovation pattern and 8 copyrights. Dr. Raja Izamshah has delivered numerous speech/keynote/invited/lectures nationally and internationally in the area of aerospace machining and Editor for several academic journals. Currently, he is the Head of Precision Machining Group at Advanced Manufacturing Center. His current research interest includes precision machining, numerical simulation and optimization for aerospace and medical fields.