

REMARKS ON RESEARCH AND FLUID-PARTICLE SEPARATIONS

George Chase, University of Akron

Fluid-Particle Separations (FPS) technologies have advanced significantly over the past 50 years. Advancements in particle detection and fiber media fabrication have remarkably improved filter performance and the FPS community's ability to address societal issues. Unfortunately, perceptions persist that FPS is low tech while the opposite is true. Perceptions also exist that FPS is application specific and is not fundamental in nature. This may or may not influence government funding agencies but there is a general trend for government agencies to prefer more attractive technologies. This means that much of FPS research relies upon industrial funding. Industrial sponsorship also has challenges, such as overcoming issues regarding intellectual property ownership. Some compromise is needed and in most cases, agreements can be reached. Options for IP are discussed.

Over the past 30 years many FPS research projects have been sponsored by industrial companies at Akron. One of the important topics supported by industry is Electrospinning led by Professor Darrell Reneker. His three highly cited papers published in 1995, 1996, and 2000 introduced electrospinning to thousands of researchers around the world. His works prompted a growth of electrospinning research and publications that continues today. By end of 2019 about 120,000 documents on Electrospinning will have been published. Electrospun submicron fibers have become a platform technology for researchers to explore the use of small fibers in a broad range of applications well beyond those for FPS.

Electrospinning depends upon an applied electric field to launch a polymer liquid jet to form the fibers. Electric fields can also be applied directly to improve FPS. Recent results show enhanced separations of liquid droplets. There are gaps in the technologies of applied electric fields for FPS for which industries could support fundamental and applied research projects. Technologies such as this could continue the high-tech advancements of FPS for another 50 years.