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Surfaces of Fluoroelastomer Nanocomposites DAVID PAN, Xerox Wilson Center for Research & Technology — Stiffening or reinforcement of elastomer with a second hard particle phase to produce a networked or crosslinked composite is common in applications of high-performance elastomers. The average size of reinforcing particle is frequently in the range of a few tenths to several microns, the shape from spheres to cylinders of high aspect ratio, and the particle concentration can be as high as about 50% by weight partly because of ease of dispersing a small number of large particles. One of the main problems with micro-filled fluoroelastomer surfaces is the continuous removal of large particles by abrasion and wear resulting in large pits or surface defects. Furthermore, these large pits can lead to a roughened surface. The aim of this work is to investigate the influence of nano-particles versus micro-particles on the surface defect size and density of filled fluoroelastomer. We applied scanning electron microscopy (SEM) and energy dispersive X-ray analysis (EDX), and surface roughness measurement to examine the surfaces of paper abraded fluoroelastomer nanocomposites. Qualitatively, SEM images show the surface defect size or density of nanocomposites is generally reduced, as compared to that of fluoroelastomer microcomposites. On a somewhat larger scale, it is found that the surface roughness (Ra) of paper abraded nanocomposites can be controlled to less than 0.2 to 0.3 microns.

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