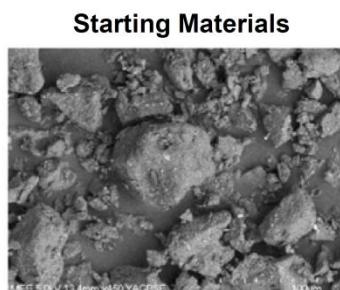


### Background

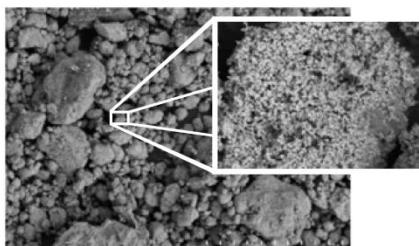
Resodyn Acoustic Mixers has developed a novel mixer product line that uses low-frequency, high-intensity sound energy for mixing. The mixer technology, trademarked under the name ResonantAcoustic®, is applicable to a broad range of mixing classes that include gases, liquids, solids and powders systems. Highlighted here is just one of many applications: **Blending Nanoparticles with Micron Sized Particles.**

### Nanoparticle Blending

A micron-sized polymer powder was blended with a nano-sized oxide powder in a dry state. The images on the right, taken with a scanning electron microscope, show the starting materials in the first column and the mixed powders in the second. The average diameters of the polymer particles and the oxide agglomerates were 40 microns and 30 microns respectively, whereas the individual nanoparticles had an average diameter of 50 nm. After only ten minutes of mixing the two materials were thoroughly blended and the surface of the polymer powder was uniformly coated with the nano-sized oxide.

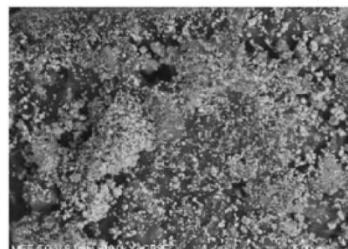


Micron-sized polymer powder shown at 500X magnification.

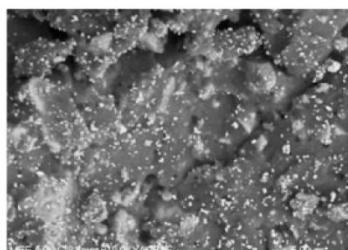


Iron oxide nanopowder agglomerates at 500X magnification and inset at 10 000X magnification.

### After 10 Minutes Mixing



Surface of the polymer powder coated with iron oxide (10 000X)



Single nanoparticles dispersed over the polymer surface.

### ResonantAcoustic® Mixer Benefits

- Easy cleaning
- Blends dissimilar powders
- Fast mixing times
- Easy to empty
- Can mix in the shipping container
- Blends cohesive powders
- Breaks loose agglomerations
- Can mix hazardous materials
- Batch operation
- Can combine processing steps such as coating and mixing