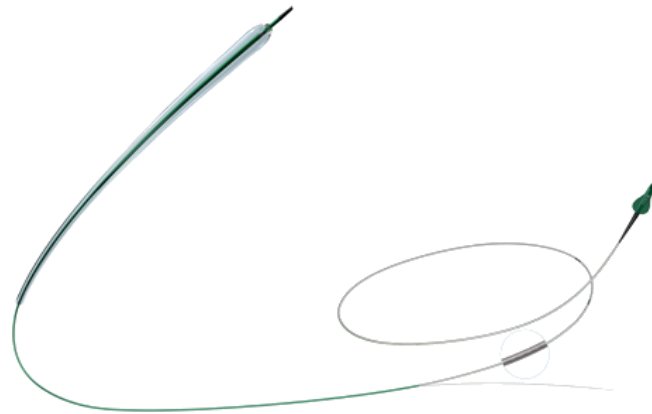


Nano Particle Reinforced Polymer Technology

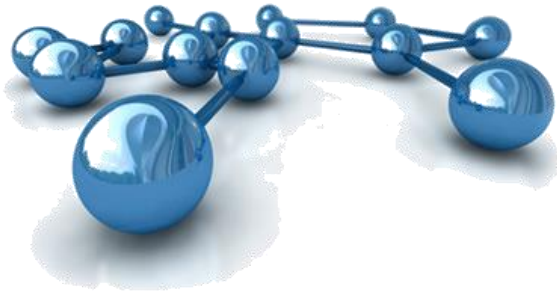


Nano Reinforced Compounds: Defined

Addition of nano particle to polymer matrix

Nano particle: one dimension $<$ nanometer

High Aspect (length/thickness) Ratio



Aspect Ratio

Length : Thickness ratio

Effectiveness of reinforcement in polymer matrix

How much stress transferred to fibers or platelets

↑ aspect ratio reinforcement = ↑ increase in strength

Nano Clay

< 1nm thick

Aspect Ratio: 300:1 – 1500:1



Why Nano Compounds?

Low Filler Loadings Required

Improves rigidity ('catheter pushability')

Preserves elongation of polymer

Preserves surface finish

Light weight blend

Unique particle/shape

Improves barrier properties

Non-organic = improves thermo-mechanicals

Char forming = flame retardance

Nucleating = improves processing time

Nano Clay



Clay Platelets Held by Electrostatic Forces

Negative Surface Charge

Nano Clay is Difficult to Mix in Polymers

Twin Screw Compounding

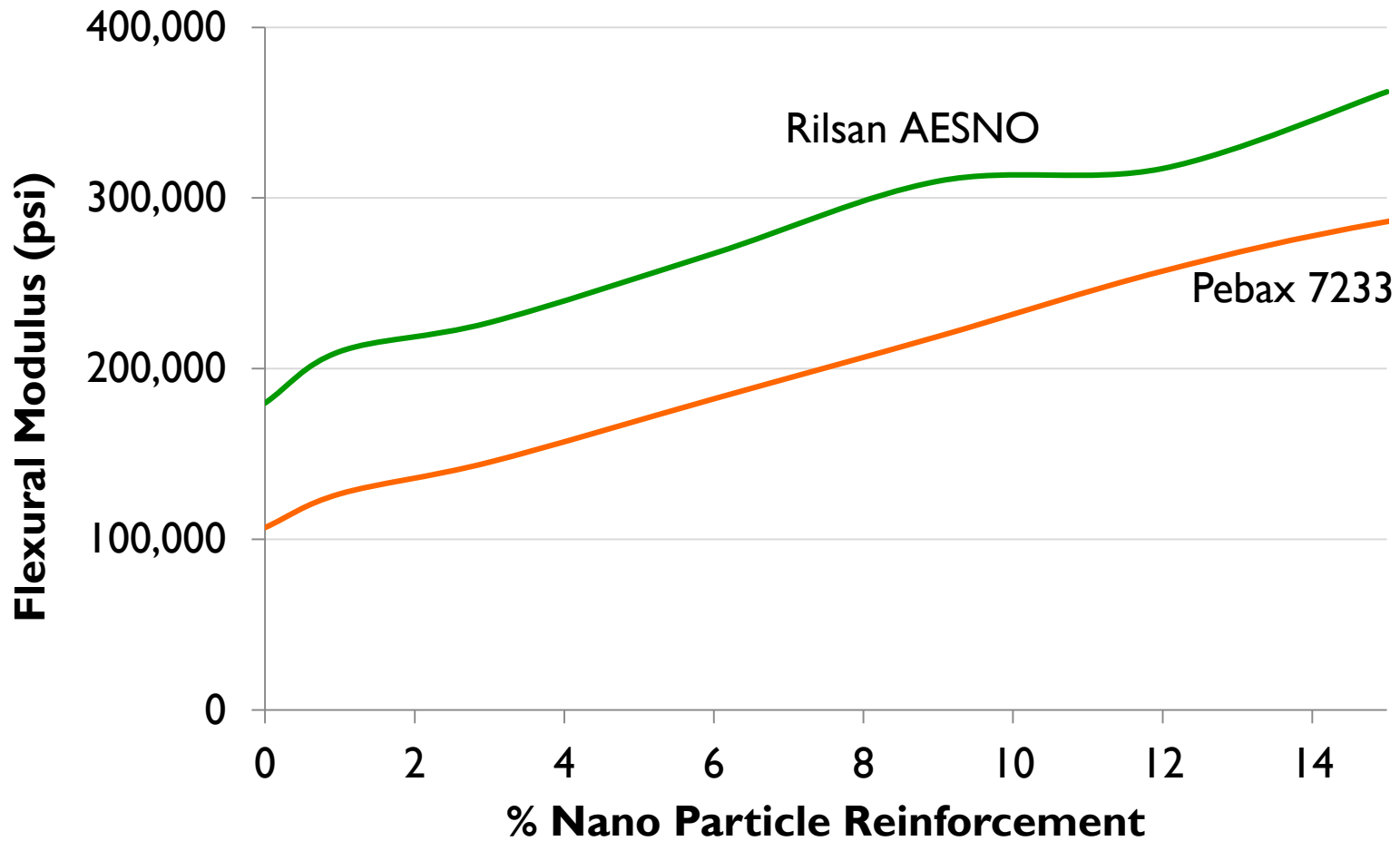


Dry form: nano clay clusters or aggregates

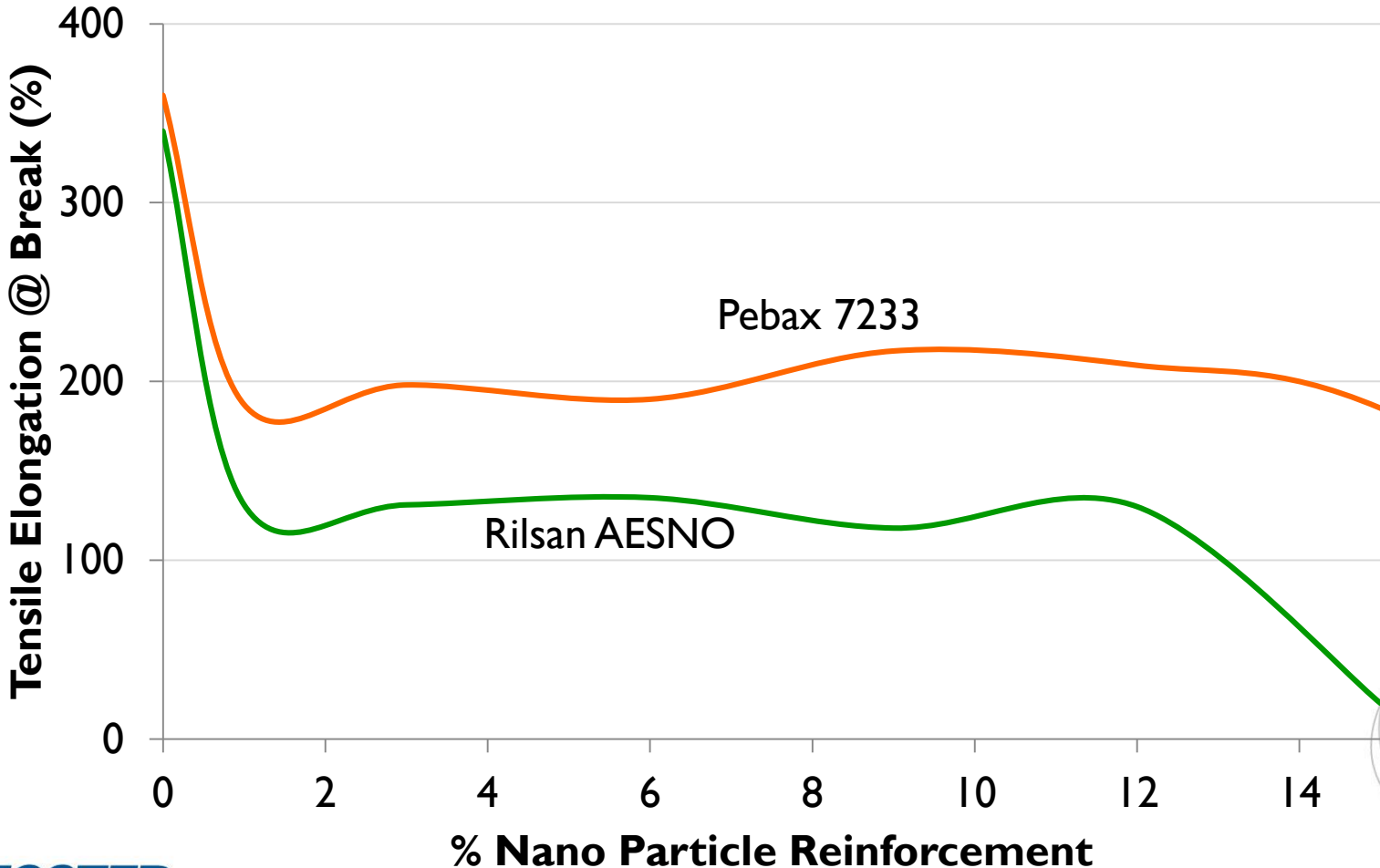
Exfoliation exposes surface area of particles

Twin screw compounding:
homogenous distribution

Improved Rigidity/Torque



Preserves Ductility

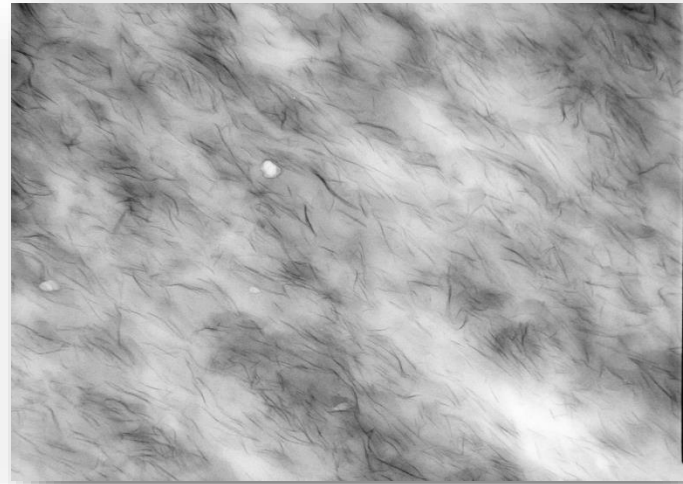


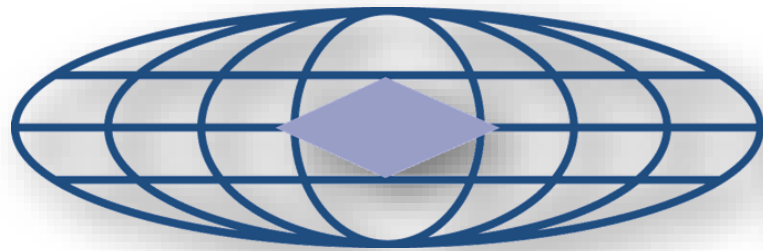
Nylon 12 (Aesno) Dispersion

Natural



Nanoclay





FOSTER

Biomedical Polymer Solutions™