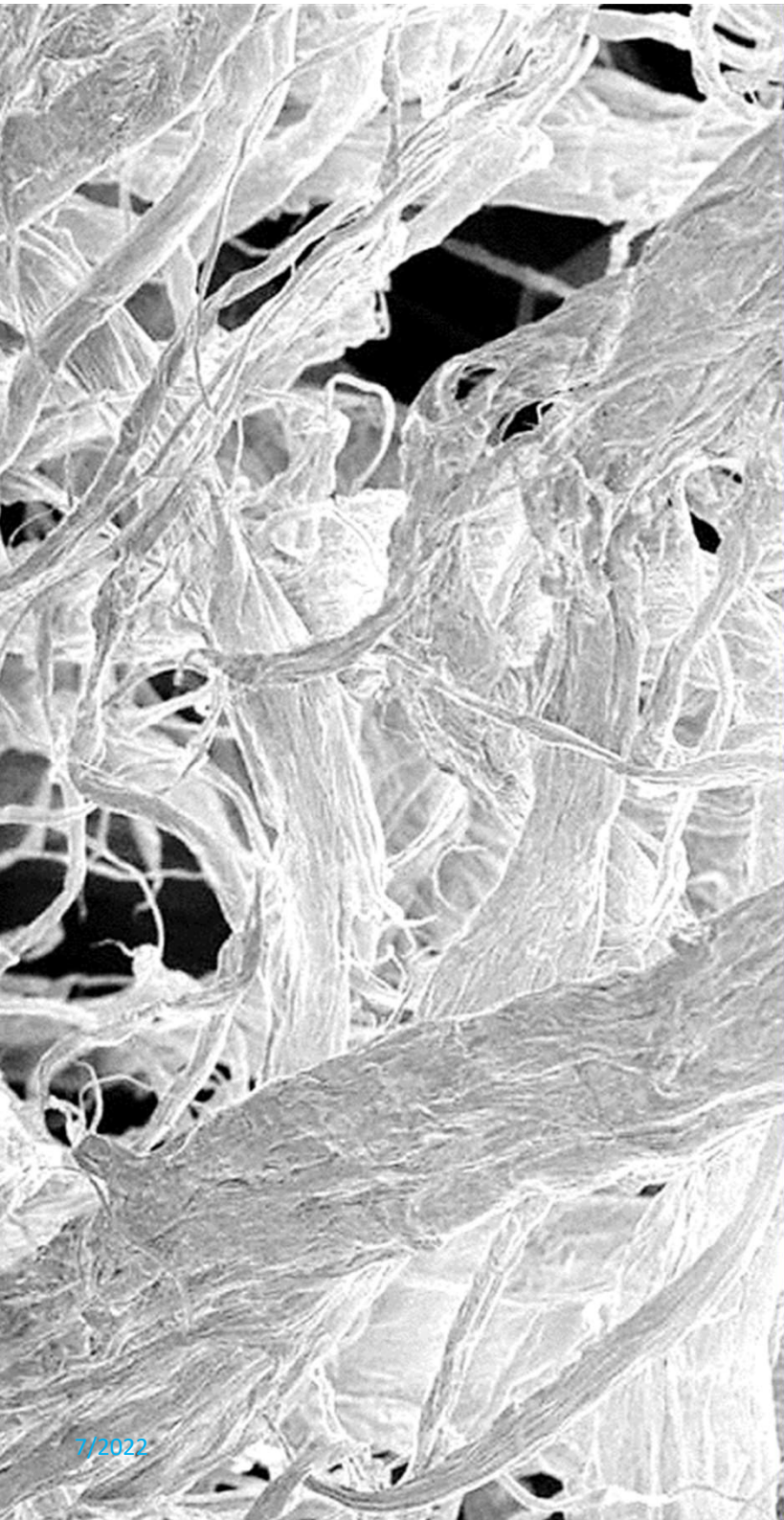


Particle Suspension and Prevention of Sedimentation with Short Stuff® Fibrillated HDPE

MINIFIBERS, INC.



Short Stuff® - What is it?

Fibrillated High-Density Polyethylene

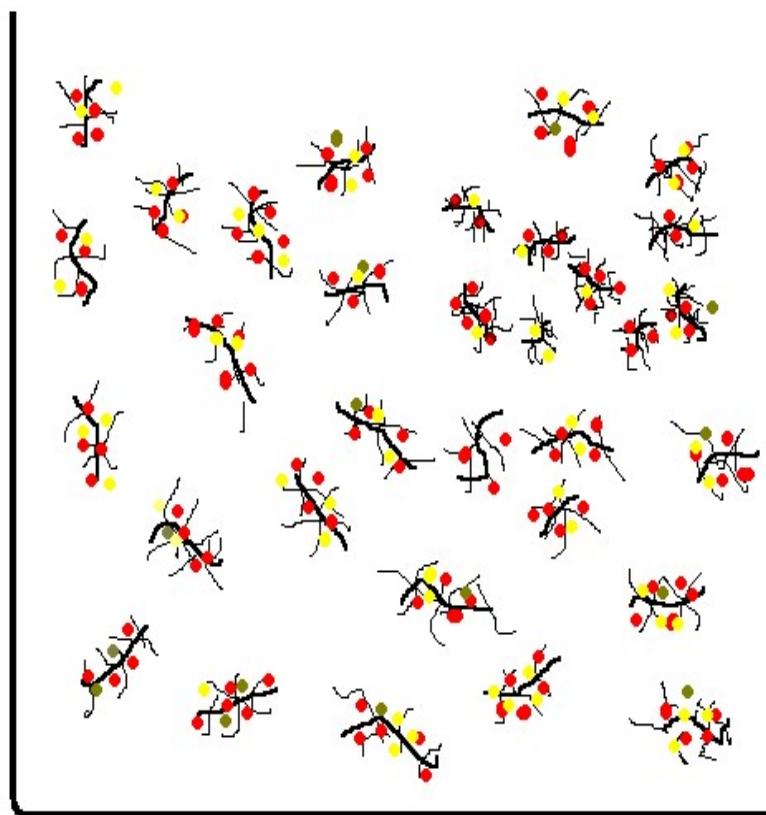
Fibrillated – What does that mean?

- fibrils
- a threadlike fiber or filament

thefreedictionary.com

Short Stuff® - How does it work?

Particles and Fibrils Entangle
- Provides Suspension and Prevents Settling



Improving Particle Suspension

- Unable to disperse a solid in your paint?
- Need to disperse very hydrophobic solids?
- Want to reduce the need for other dispersants?

SHORT STUFF® CAN HELP...

Improving Particle Suspension

- SHORT STUFF can suspend any particulate
 - Clay
 - Iron Oxide
- SHORT STUFF can also suspend lighter solids
 - Cenospheres
 - Glass Bubbles

Clay



No Fiber



After Mixing with 1% Fiber



After Sitting 18 months

Iron Oxide



No Fiber



After Mixing with 1% Fiber



After Sitting 18 months

Cenospheres



No Fiber



After Mixing with 1% Fiber



After Sitting 18 months

Glass Bubbles



No Fiber



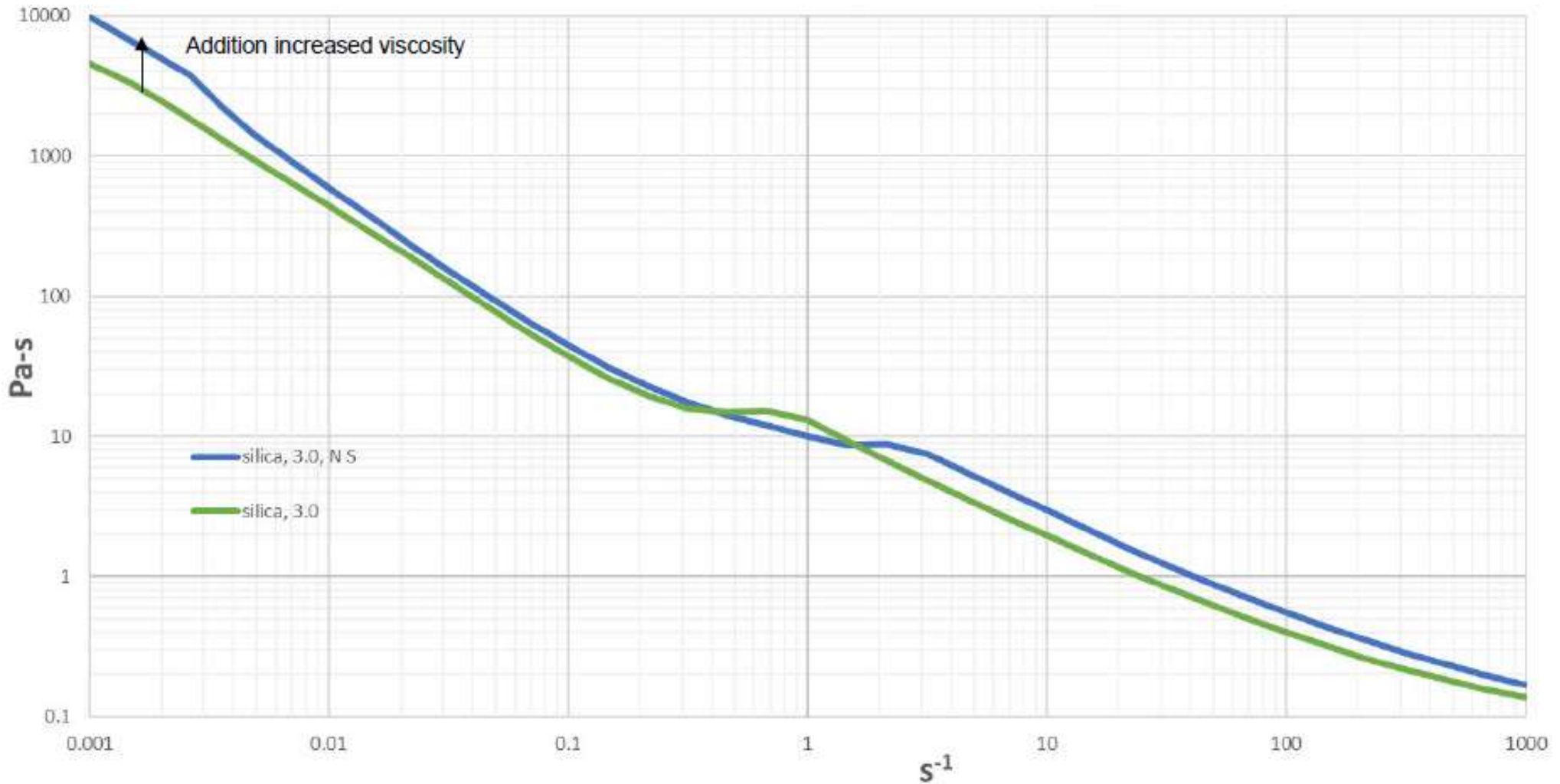
After Mixing with 1% Fiber



After Sitting 18 months

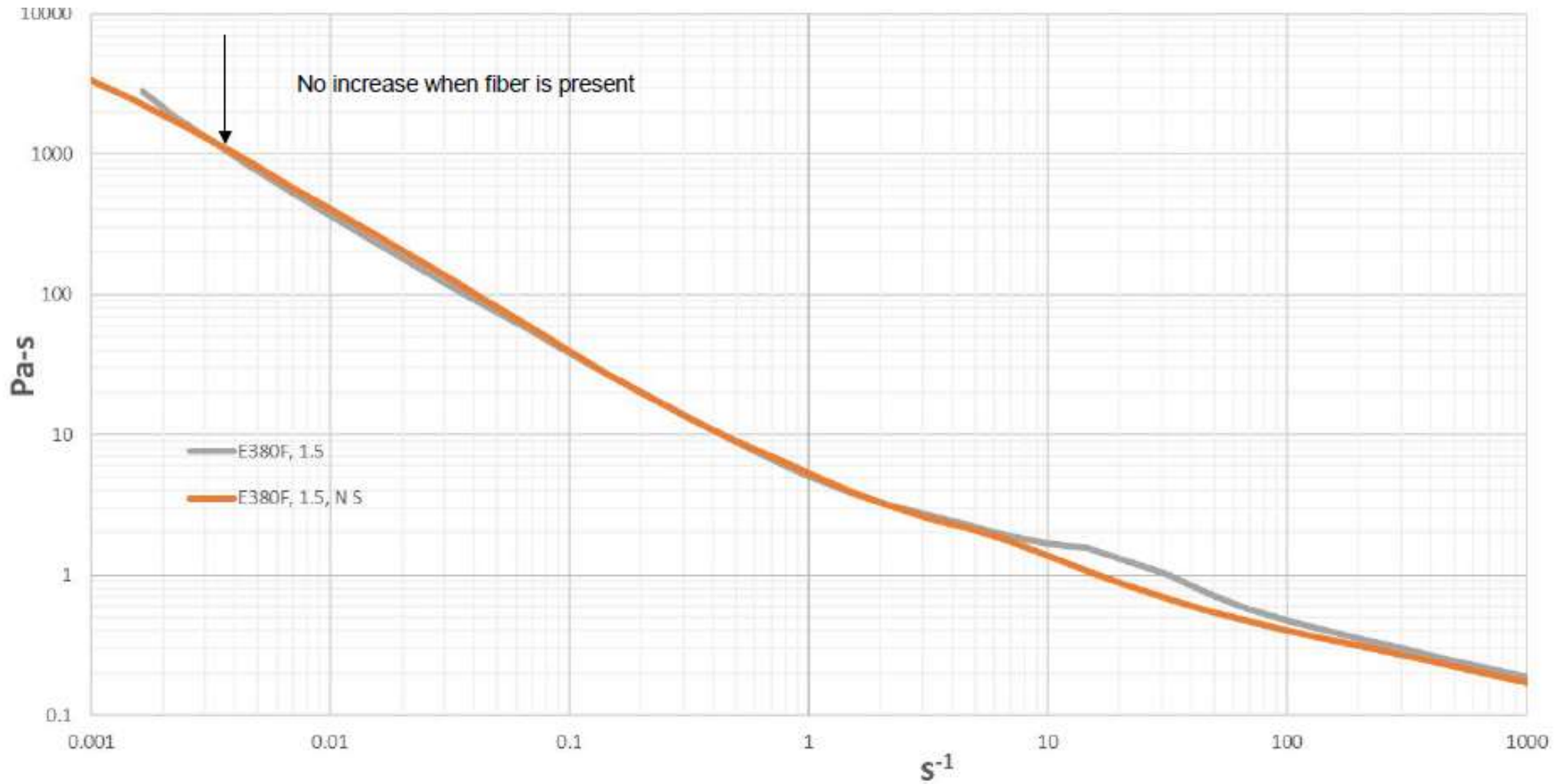
Fumed Silica with Nepheline Syenite

In Epoxy / Methoxypropanol



Short Stuff[®] with Nepheline Syenite

In Epoxy / Methoxypropanol



Preventing Sedimentation

HARD SETTLING...

- Reduces shelf life
- Results in returns
- Increases potential for claims

SHORT STUFF® CAN HELP!

Preventing Sedimentation

EXAMPLE: SUSPENSION OF BARYTES

- ~10g of Barium Sulfate
 - 10-micron particle size, natural
- 100g water
- Cowles dispersed, stored 11 days

Control – No Short Stuff®

Re-agglomerated
and Immobile



+0.25% Small Treated Short Stuff[®]

Some Improvement



1.0% Small Treated Short Stuff®

Significant Improvement

Softer





+0.25% Long Treated Short Stuff[®]

Improved,
better than
Short Fibers



+1.0% Long Treated Short Stuff®

Best Result!
Completely Soft

Range of Sizes

SHORT STUFF[®] Highly Fibrillated HDPE

GRADE	ESS5F	* ESS50F	ESS2F	* ESS20F	E380F	* E505F	E620F	E780F	E990F
Average Length (mm)	~0.1	~0.1	~0.6	~0.6	~0.5	~0.6	~0.65	~0.9	~1.0
Diameter (microns)	5	5	5	5	15	15	15	25	20
Surface Area (m ² /gm) Measured by gas absorption	12	12	12	12	8	8	8	8	8
Melting Point	~135°C / ~275°F								
Moisture Content (%)	<2.0								
Specific Gravity (g/cm ³)	0.96								

* For improved dispersion in aqueous systems.

Product Selection

- Use treated grades for waterborne systems
- Use untreated grades for solvent borne systems
- Note: Texture will result if the size of Short Stuff[®] is larger than the final dry thickness of the film

Processing Tips

- **Add early in the mix!**
- Short Stuff[®] is robust and does not degrade under high-speed dispersion shear
- Addition rates
 - For suspension – 0.25% to 0.75%
 - For film toughness – 0.8 to 1.25%
 - For rheology – what is needed – works well with all other thickener technologies

Additional Benefits

SHORT STUFF®:

- ✓ Improves flexibility and crack resistance
- ✓ Improves impact resistance
- ✓ Improves water resistance
- ✓ Improves freeze thaw performance
- ✓ Imparts predictable rheology
- ✓ Improves coalescence and compatibilization



Short Stuff® Fibrillated HDPE is available from

MINIFIBERS, INC.

www.minifibers.com