

## **Shear Thickening Fluid References (N.J. Wagner)**

*Updated 5 November 2009*

### **Conference Proceedings:**

1. J. M. Houghton, B. A. Schiffman, D. P. Kalman, E. D. Wetzel, and N. J. Wagner, "Hypodermic Needle Puncture of Shear Thickening Fluid (STF)-Treated Fabrics", to appear in *Proceedings of SAMPE, 2007*, Baltimore MD.  
[View Full Publication](#)
2. D. P. Kalman, J. B. Schein, J. M. Houghton, C. H. N. Laufer, E. D. Wetzel and N. J. Wagner, "Polymer Dispersion-Based Shear Thickening Fluid-Fabrics for Protective Applications", to appear in *Proceedings of SAMPE, 2007*, Baltimore MD.  
[View Full Publication](#)
3. Brian A. Rosen, Caroline H. Nam Laufer, Dennis P. Kalman, Eric D. Wetzel, and Norman J. Wagner, "Multi-Threat Performance of Kaolin-Based Shear Thickening Fluid (STF)-Treated Fabrics", to appear in *Proceedings of SAMPE, 2007*, Baltimore MD.  
[View Full Publication](#)
4. Y. S. Lee, E. D. Wetzel, R. G. Egres Jr., and N. J. Wagner, "Advanced Body Armor Utilizing Shear Thickening Fluids," in *Proceedings of the 23rd Army Science Conference*, (Orlando, FL, December 2-5, 2002).  
[View Full Publication](#)
5. R. G. Egres Jr., Y. S. Lee, J. E. Kirkwood, K. M. Kirkwood, E. D. Wetzel and N. J. Wagner, "Novel Flexible Body Armor Utilizing Shear Thickening Fluid (STF) Composites," in *Proceedings of the 14th International Conference on Composite Materials*, (San Diego, CA, July 14-18, 2003).
6. E. D. Wetzel, Y. S. Lee, R. G. Egres Jr., K. M. Kirkwood, J. E. Kirkwood, and N. J. Wagner, "The Effect of Rheological Parameters on the Ballistic Properties of Shear Thickening Fluid (STF)-Kevlar Composites," in *Proceedings of the 8th International Conference on Numerical Methods in Industrial Forming Processes*, Columbus, OH, June 13-17, 2004).  
[View Full Publication](#)
7. R. G. Egres and N. J. Wagner, "The Rheology and Rheo-SANS Microstructure Analysis of Shear Thickening Acicular Precipitated Calcium Carbonate Dispersions." in *Proceedings of the XIVth International Congress on Rheology*, (Seoul, South Korea, August 22-27, 2004).
8. R. G. Egres Jr, Y. S. Lee, J. E. Kirkwood, K. M. Kirkwood, E. D. Wetzel, N. J. Wagner, "Liquid Armor: Protective Fabrics Utilizing Shear Thickening Fluids," in *Proceedings of the 4<sup>th</sup> International Conference on Safety and Protective Fabrics*, (Pittsburgh, PA, October 26-27, 2004).  
[View Full Publication](#)
9. R. G. Egres Jr., M. J. Decker, C. J. Halbach, Y. S. Lee, J. E. Kirkwood, K. M. Kirkwood, E. D. Wetzel, N. J. Wagner, "Stab Resistance of Shear Thickening Fluid (STF)-Kevlar Composites for Body Armor Applications," in *Proceedings of the 24<sup>th</sup> Army Science Conference*, (Orlando, FL, November 29-December 2,

2004).

[View Full Publication](#)

10. R. G. Egres Jr., C. J. Halbach, M. J. Decker, E. D. Wetzel, and N. J. Wagner. "Stab performance of shear thickening fluid (STF)-fabric composites for body armor applications." *Proceedings of SAMPE 2005: New Horizons for Materials and Processing Technologies*. Long Beach, CA. May 1-5, 2005.
11. Caroline H. Nam, Matthew J. Decker, Christopher Halbach, Eric D. Wetzel, and Norman J. Wagner. "Ballistic and rheological properties of shear thickening fluids (STFs) reinforced by short, discontinuous fibers." *Proceedings of SAMPE 2005: New Horizons for Materials and Processing Technologies*. Long Beach, CA. May 1-5, 2005.
12. M. J. Decker, R. G. Egres, E. D. Wetzel, and N. J. Wagner. "Low velocity ballistic properties of shear thickening fluid (STF)-fabric composites." *Proceedings of the 22nd Int. Symp. on Ballistics*. 14-18 November 2005.
13. Nam, C. H., Wagner, N. J., "Thixotropy and Shear-Induced Microstructure of Shear Thickening, Nanoaggregate, Fumed Silica Dispersions", *American Institute of Chemical Engineers Annual Meeting*, Cincinnati, OH, November 2005
14. Nam, C. H., Wetzel, E. D., Wagner, N. J., "Ballistic and Rheological Properties of Shear Thickening Fluids Reinforced By Short Discontinuous Fibers", *American Institute of Chemical Engineers Annual Meeting*, Cincinnati, OH, November 2005.

### Manuscripts in Scientific Journals

1. "Stab resistance of shear thickening fluid (STF)-treated fabrics" by M. J. Decker, C. J. Halbach, C. H. Nam, N. J. Wagner and E. D. Wetzel, accepted, *Composites Science and Technology*, August, 2006
2. "Rheological Properties and Small Angle Neutron Scattering of a Shear Thickening, Nanoparticle Dispersion at High Shear Rates", Young S. Lee and Norman J. Wagner, to appear *I&EC Research*, Nov. 2006.
3. "Rheo-SANS investigation of acicular precipitated calcium carbonate colloidal suspensions through the shear thickening transition", Ronald G. Egres, Florian Nettesheim and N. J. Wagner, To appear, *J. Rheology*,. 2006.
4. "Shear Thickening in Polymer Stabilized Colloidal Dispersions", Lakshminarasimhan Krishnamurthy, Norman J. Wagner and Jan Mewis, *J. Rheology*, **39**(6), 1347-1360, 2005.
5. "Influence of Medium Viscosity and Adsorbed Polymer on the Reversible Shear Thickening Transition in Concentrated Colloidal Dispersions", Sudhir S. Shenoy and Norman J. Wagner, *Rheol. Acta*, **44**, 360-371, 2005.
6. "The rheology and microstructure of acicular precipitated calcium carbonate colloidal suspensions through the shear thickening transition", Ron Egres and Norman J. Wagner, *Journal of Rheology*, **49**(3), 719-746, 2005.
7. "Yarn pull-out as a mechanism for dissipating ballistic impact energy in Kevlar((R)) KM-2 fabric - Part I: Quasi-static characterization of yarn pull-out", Keith Kirkwood, John Kirkwood, Eric D. Wetzel, Young S. Lee and Norman J. Wagner, *Textile Research Journal*, **74**(10), 920-928, Oct. 2004.

[View Full Publication](#)

8. "Yarn Pull-Out as a Mechanism for Dissipation of Ballistic Impact Energy in Kevlar® KM-2 Fabric, Part II: Prediction of Ballistic Performance", John E. Kirkwood, Keith M. Kirkwood, Young Sil Lee, Ronald G. Egres Jr., Eric D. Wetzel and Norman J. Wagner, *Textile Research Journal*, **74**(11), 939-948, 2004  
[View Full Publication](#)
9. "The ballistic impact characteristics of Kevlar® woven fabrics impregnated with a colloidal shear thickening fluid", Young S. Lee, Eric D. Wetzel and Norman J. Wagner, *J. Mat. Sci.*, **38**(13) 2825-2833, 2003.  
[View Full Publication](#)
10. "Dynamic properties of shear thickening colloidal suspensions", Young S. Lee and Norman J. Wagner, *Rheologica Acta*, **42**(3), 199-208, 2003.  
[View Full Publication](#)
11. "Flow-Small Angle Neutron Scattering Measurements of Colloidal Dispersion Microstructure Through the Shear Thickening Transition", Brent J. Maranzano and Norman J. Wagner, *J. Chem. Phys.*, **117**, 10291-10302, 2002. Also selected to appear on the Virtual Journal of Nanoscale Science & Technology, Dec. 2<sup>nd</sup>, 2002.
12. "The effects of interparticle interactions and particle size on reversible shear thickening: hard-sphere colloidal dispersions", Brent J. Maranzano & Norman J. Wagner, *Journal of Rheology*, **45**(5), 1205-1222, 2001.
13. "E-FiRST: Electric Field Responsive Shear Thickening Fluids", Jonathan W. Bender, Sudhir S. Shenoy and N.J. Wagner, *Rheol. Acta*, **42**, 287-294 (2003).
14. "The Effects of Particle Size on Reversible Shear Thickening of Concentrated Colloidal Dispersions", Brent J. Maranzano & Norman J. Wagner, *J. Chem. Phys.*, **114**(23), 10514-10527, 2001.
15. "Reversible Shear Thickening in Monodisperse and Bidisperse Colloidal Dispersions", J. W. Bender and N. J. Wagner, *Journal of Rheology*, **40**(5), 899-916, 1996.
16. "Optical Measurement of the Contributions of Colloidal Forces to the Rheology of Concentrated Suspensions", J. W. Bender and N. J. Wagner, *J. Coll. Int. Sci.*, **172**, 171-184, 1995.
17. "Effect of Particle Hardness on the Penetration Behavior of Fabrics Intercalated with Dry Particles and Concentrated Particle-Fluid Suspensions" by Dennis P. Kalman, Richard L. Merrill, Norman J. Wagner, and Eric D. Wetzel Applied Materials 2009 DOI: 10.1021/am900516w (full reference forthcoming when in print). Please go to <http://pubs.acs.org/journal/aamick> for free reprints.
18. "Development of the split-Hopkinson pressure bar technique for viscous fluid characterization", by Amanda S. Lim, Sergey L. Lopatnikov, John W. Gillespie, Jr., *Polymer Testing*, 2009.  
[View Full Publication](#)