

Abstract Submitted
for the DFD12 Meeting of
The American Physical Society

Effect of dilatant additive on stability of waterjet NARIMAN ASHRAFI, Azad University — Effect of addition of dilatant cornstarch on the stability and precision enhancement of the abrasive waterjet is studied. It is shown that the normal stresses developed in the nonlinear viscoelastic additive remains substantially unchanged throughout effective length of the jet resulting in an almost completely prismatic jet, applicable for precision and straight machining. Furthermore, the jet becomes more stable upon increasing the cornstarch percentage. Clearly, there is restriction of the pump delivery upon adding the dilatant cornstarch. Different percentages of the additive are therefore examined. It is found that, a %22 additive results in the best performance based on the precision, required pump power and stability of the jet. Simulation of the problem is in good agreement with the experimental observations. The additive also appears to produce less friction with the surrounding air avoiding possible jet disintegration

Nariman Ashrafi
Azad University

Date submitted: 11 Jul 2012

Electronic form version 1.4