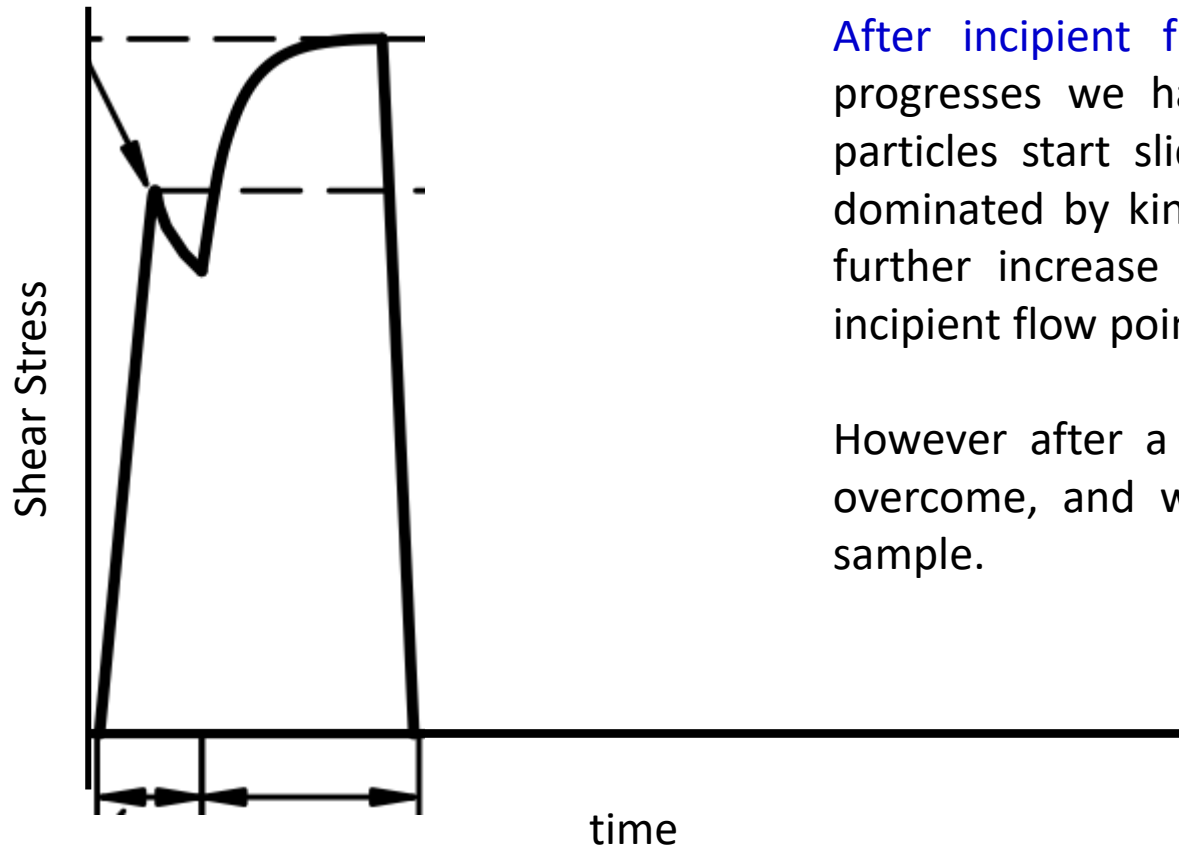


Actual Pre-Shearing Plot
(Shearing under a
predefined normal stress)



Incipient Flow

Before incipient flow all the particles are either static or undergoing small elastic deformations, incipient flow occurs at the time when we have some local zones, where particles have just started sliding against each other (it is like just overcoming the static friction between particles at a few places), which leads to a slight drop in shear stress.

After incipient flow (non-linear part of curve): However, as time progresses we have plenty of such local failure zones, and all the particles start sliding against each other. Then the overall shear stress gets dominated by kinetic friction (due to sliding/attrition), which leads to a further increase in shear stress. The non-linear part of the curve after the incipient flow point is majorly contributed by kinetic friction.

However, after a certain limit, all the cohesive forces are completely overcome, and we get a freely flowing state, termed as a preheated sample.