# New Material Drilling Discussion

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| **Point** | **LJ Material** | **Brittle Compressed (“Real”) LJ Material** | **+** | **-** |
| Material Crushing  D:\Gigs\Drilling\Run5\Impacting_polycr__n0_55000_k_5.0_A_30.00_ f0_B_15.00_ f0_AngOmega0_0.01_ 1t0_seed_ 1__Nimp_05_por_ 3.0\A_30.00f0_B_15.00f0_AngOmega0_ 0.011t0_seed_ 1\a2r_00\frame_00000.bmp | by particles | by grains | realistic | particles do not separate and do not move away |
| Particles Removing  D:\Gigs\Drilling\Run5\Impacting_polycr__n0_55000_k_5.0_A_30.00_ f0_B_24.00_ f0_AngOmega0_0.01_ 1t0_seed_ 1__Nimp_05_por_ 3.0\A_30.00f0_B_24.00f0_AngOmega0_ 0.011t0_seed_ 1\a2r_00\frame_00000.bmp | Separated particles vanish | Particles near tooltip vanish, separated grains restructure | no | 1. not realistic outwashing  2. grains cannot restructure in real |
| Shearing Strength  D:\Gigs\Drilling\Run5\Impacting_polycr__n0_55000_k_5.0_A_30.00_ f0_B_36.00_ f0_AngOmega0_0.01_ 1t0_seed_ 1__Nimp_05_por_ 3.0\A_30.00f0_B_36.00f0_AngOmega0_ 0.011t0_seed_ 1\a2r_00\frame_00000.bmp | Higher | Lower | In some cases tool just penetrate the material and starts rotation, causing shearing destruction. “Real” material has lower shearing strength as a result of lower level of intergranular interaction | |

Main troubles:

1. Material Removal Rate calculates as rate of removed particles to all particles. As particles removes incorrectly and in highly different regime, than when drilling simple LJ material, it makes impossible to compare the drilling process in this too variants.
2. Real amplitudes of loading are significantly lower than parameters of loading in computer experiment (100 times for dynamic component and 1000 times for static component of force, 100 times for angular speed of rotation) so the real loading parameters cannot now be used in computer experiment.