

Figure 1. Schematic Geometry

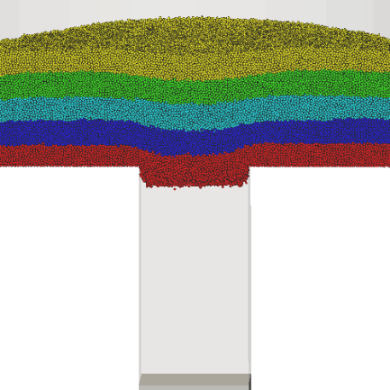
Table 1. Physical Properties

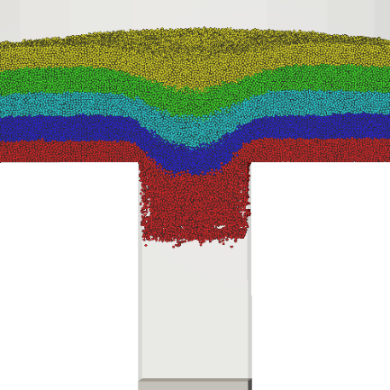
|  |  |
| --- | --- |
| Gas phase |  |
| Viscosity | 1.8×10-5 Pa・s |
| Density | 1 kg/m3 |
| Solid phase |  |
| Density | 1500 kg/m3 |
| Spring constant | 50 N/m |
| Coefficient of restitution | 0.9 |
| Coefficient of friction | 0.3 |

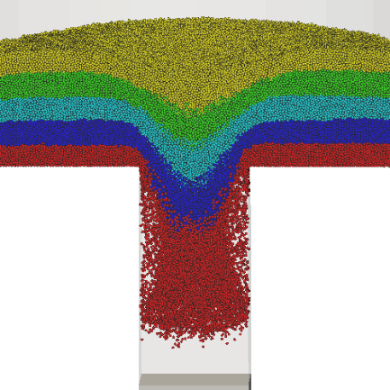
Table 2. Calculation conditions

|  |  |
| --- | --- |
| Particle diameter | 250 μm |
| Number of particles | 500,000 |
| Grid size | 0.5 mm |
| Calculation time | 0.24 s |

自然落下

 0.02 s

 0.04 s

 0.06 s

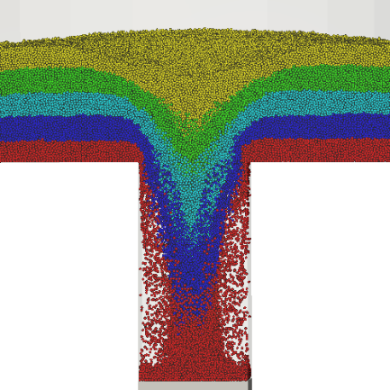
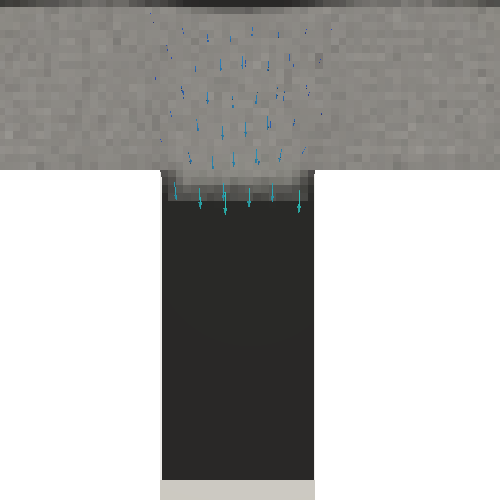
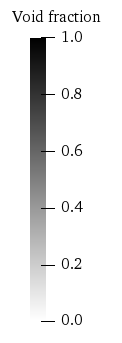
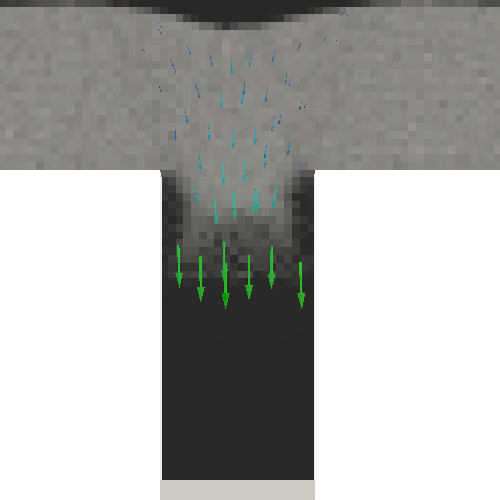
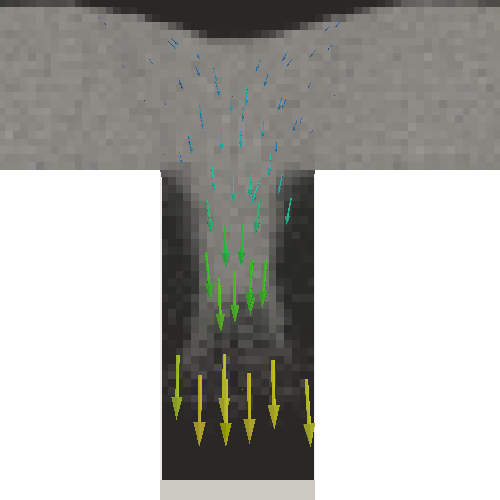
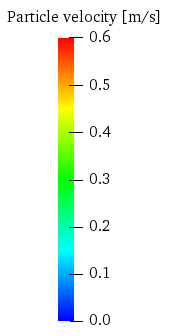
 0.08 s

Figure 2. Particle distribution

 0.02s

 0.04s

 0.06s

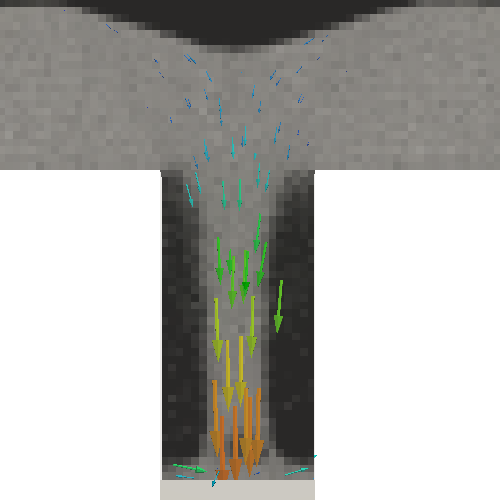
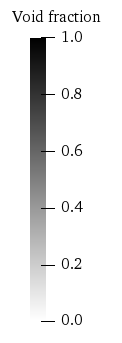
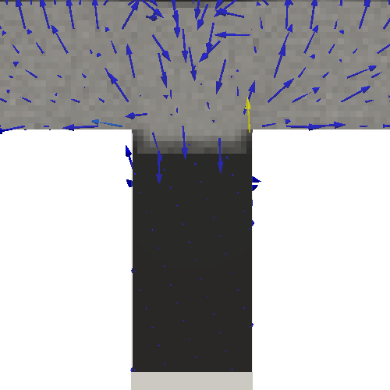
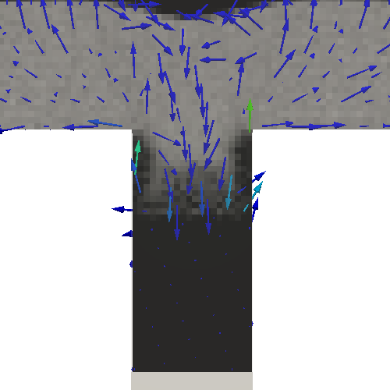
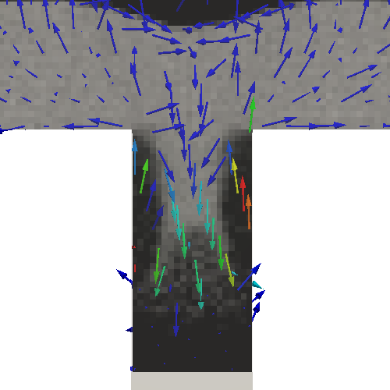
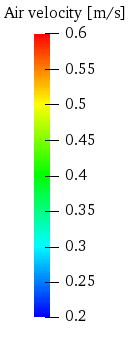
 0.08s

Figure 3. Particle velocity and void fraction rate

 0.02s

 0.04s

 0.06s

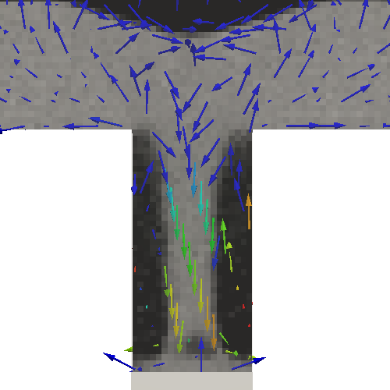
0.08s

Figure 4. Air velocity and void fraction rate

吸引効果有り

下杵降下速度100, 300, 500, 700 [mm/s]

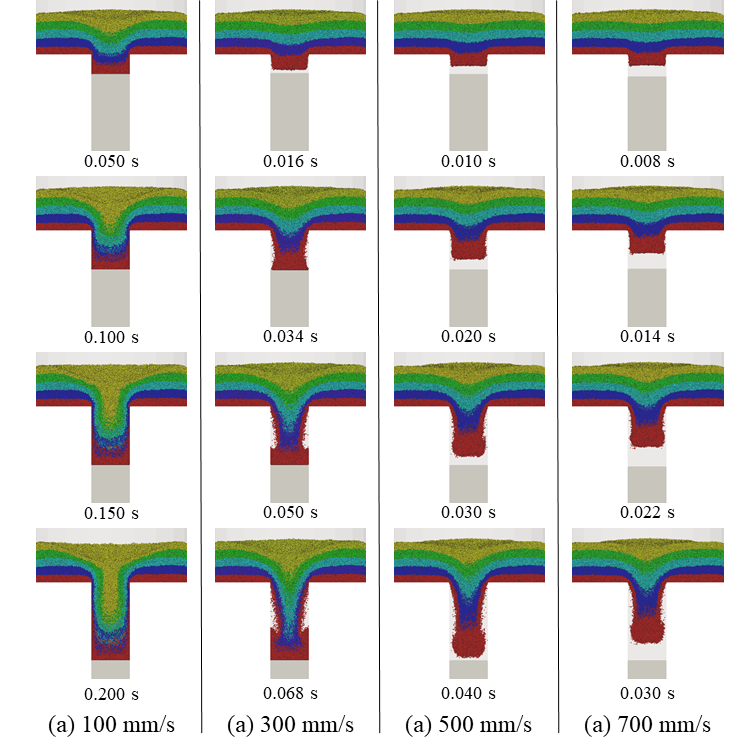


Figure 5. Particle distribution

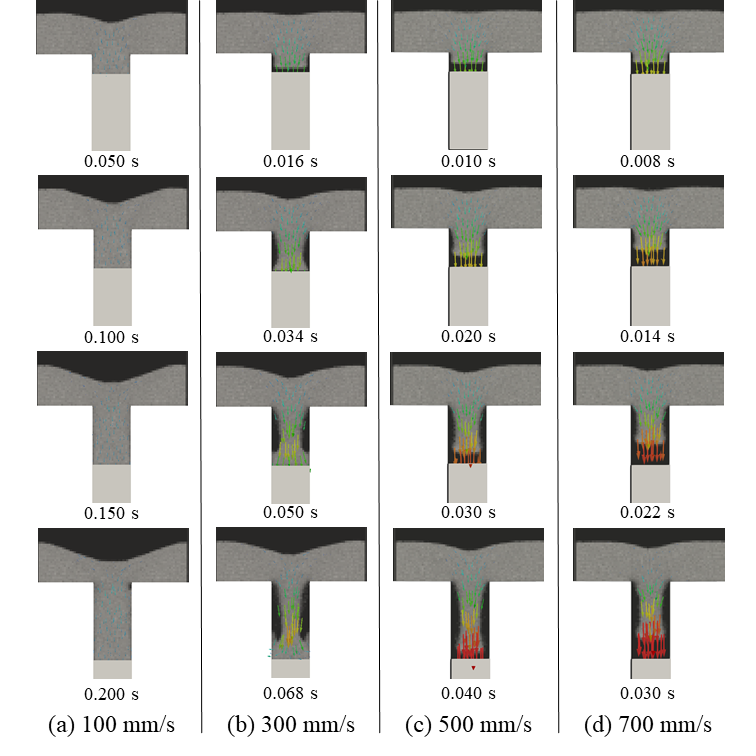
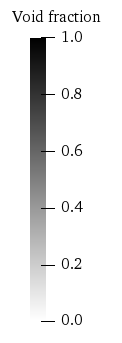
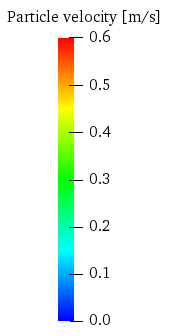
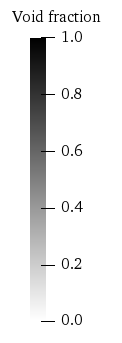
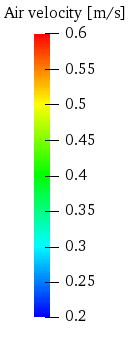


Figure 6. Particle velocity and void fraction rate



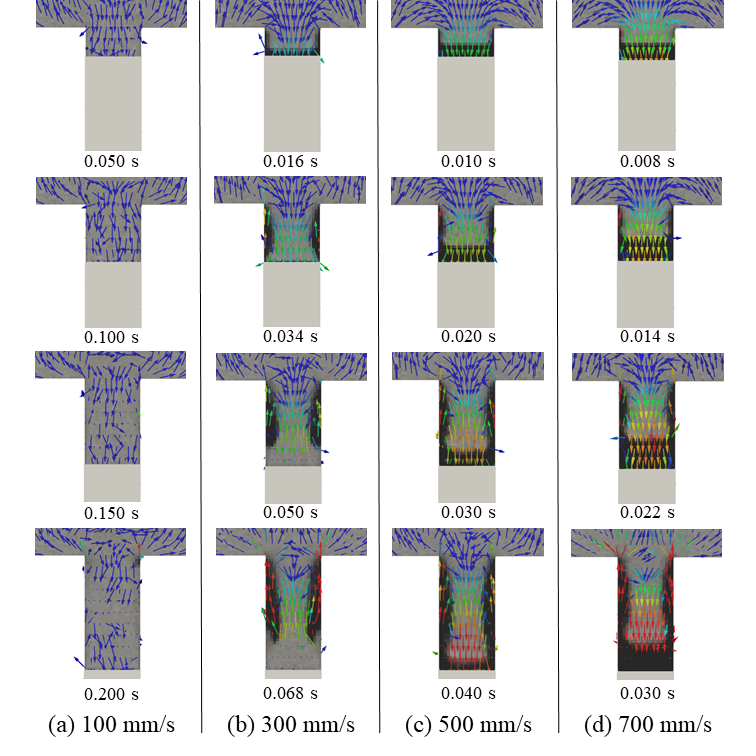
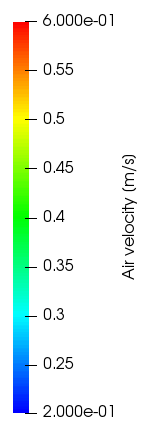


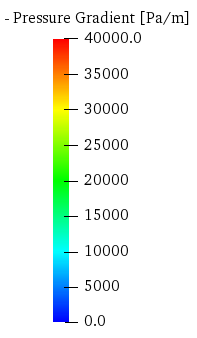
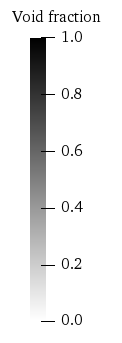
Figure 7. Air velocity and void fraction rate



Figure 8. Number of particles in die region



Figure 9. Flux of powder flow



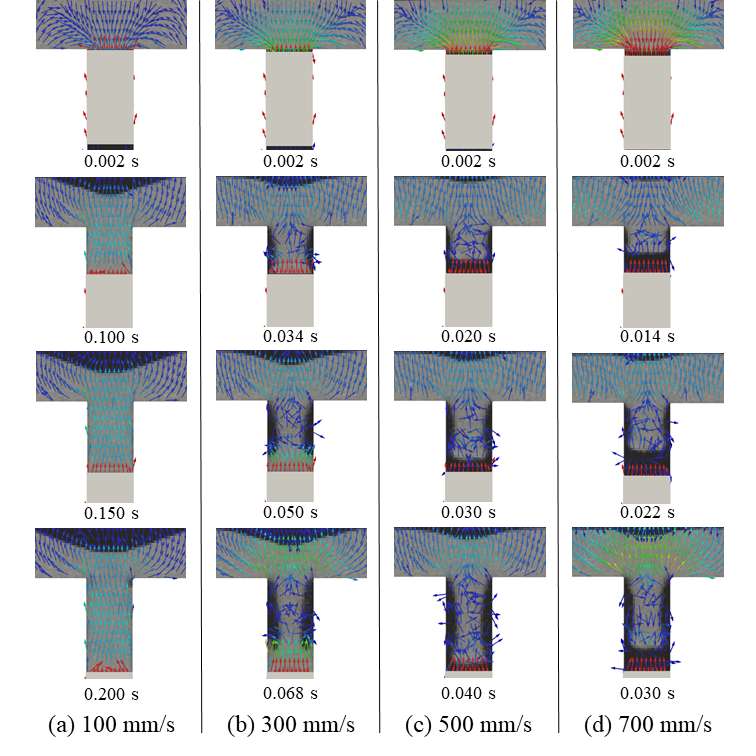
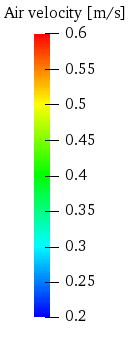
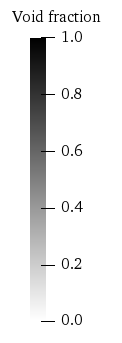


Figure 10. Pressure gradient



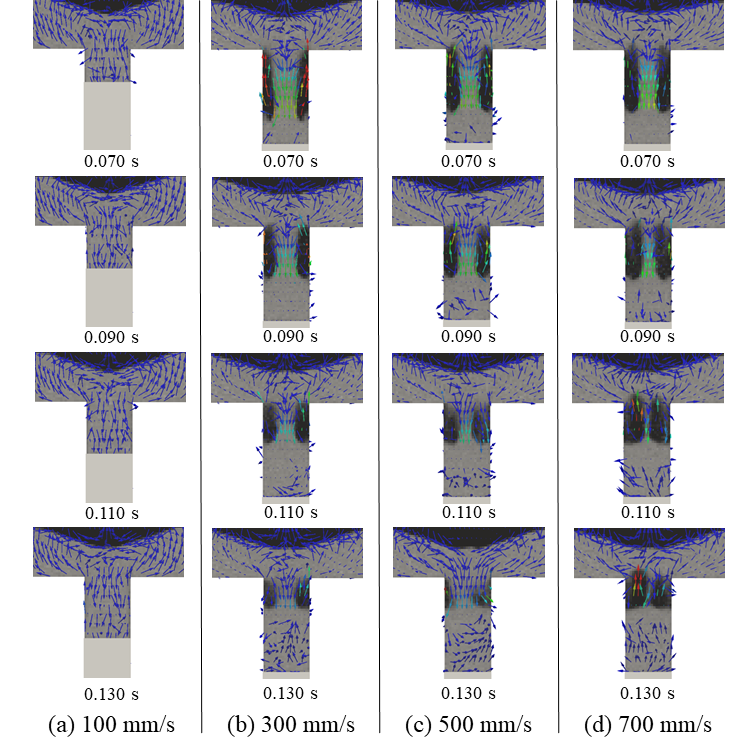


Figure 11. Bubble velocity



Figure 12. Filling time