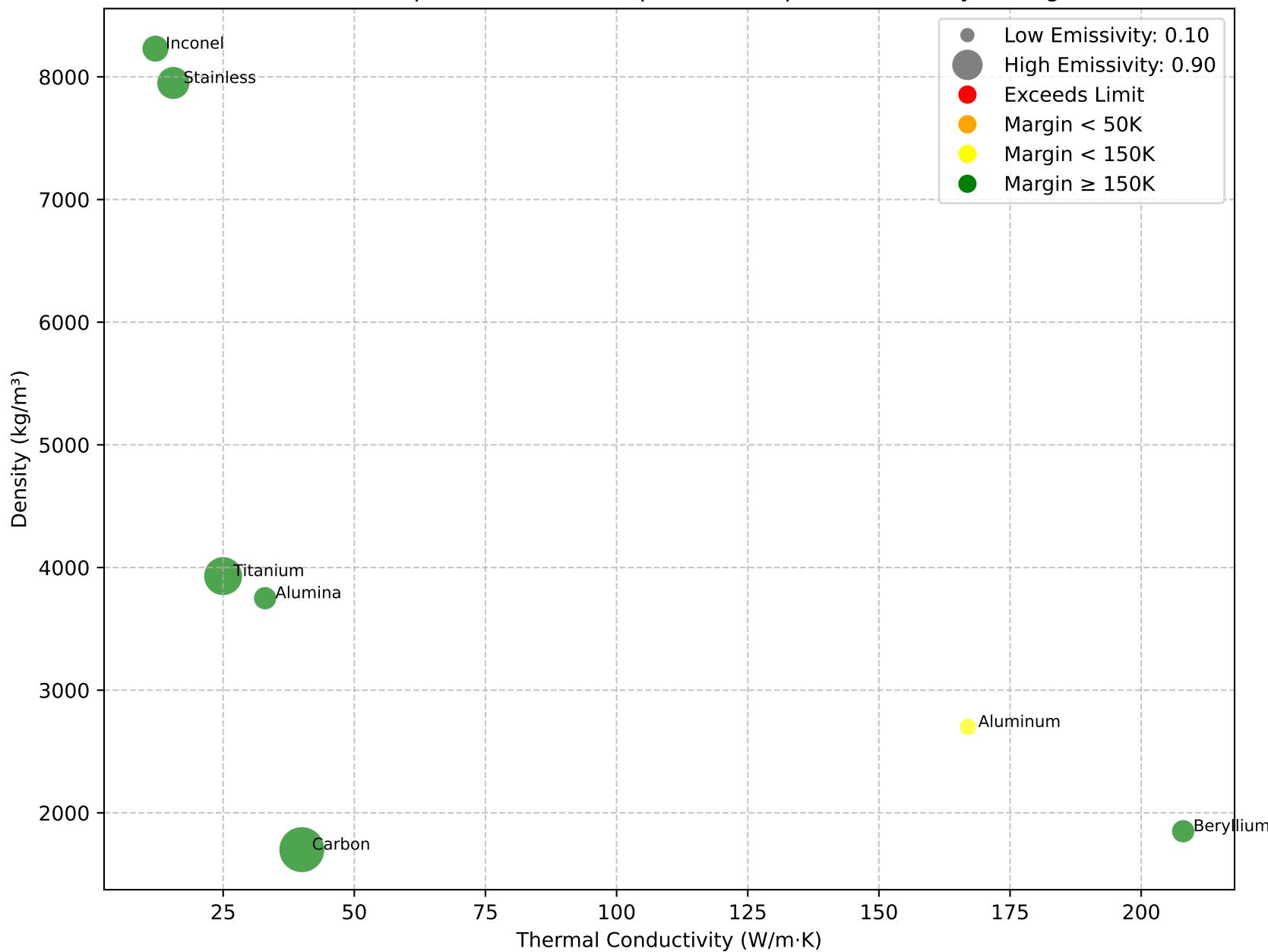
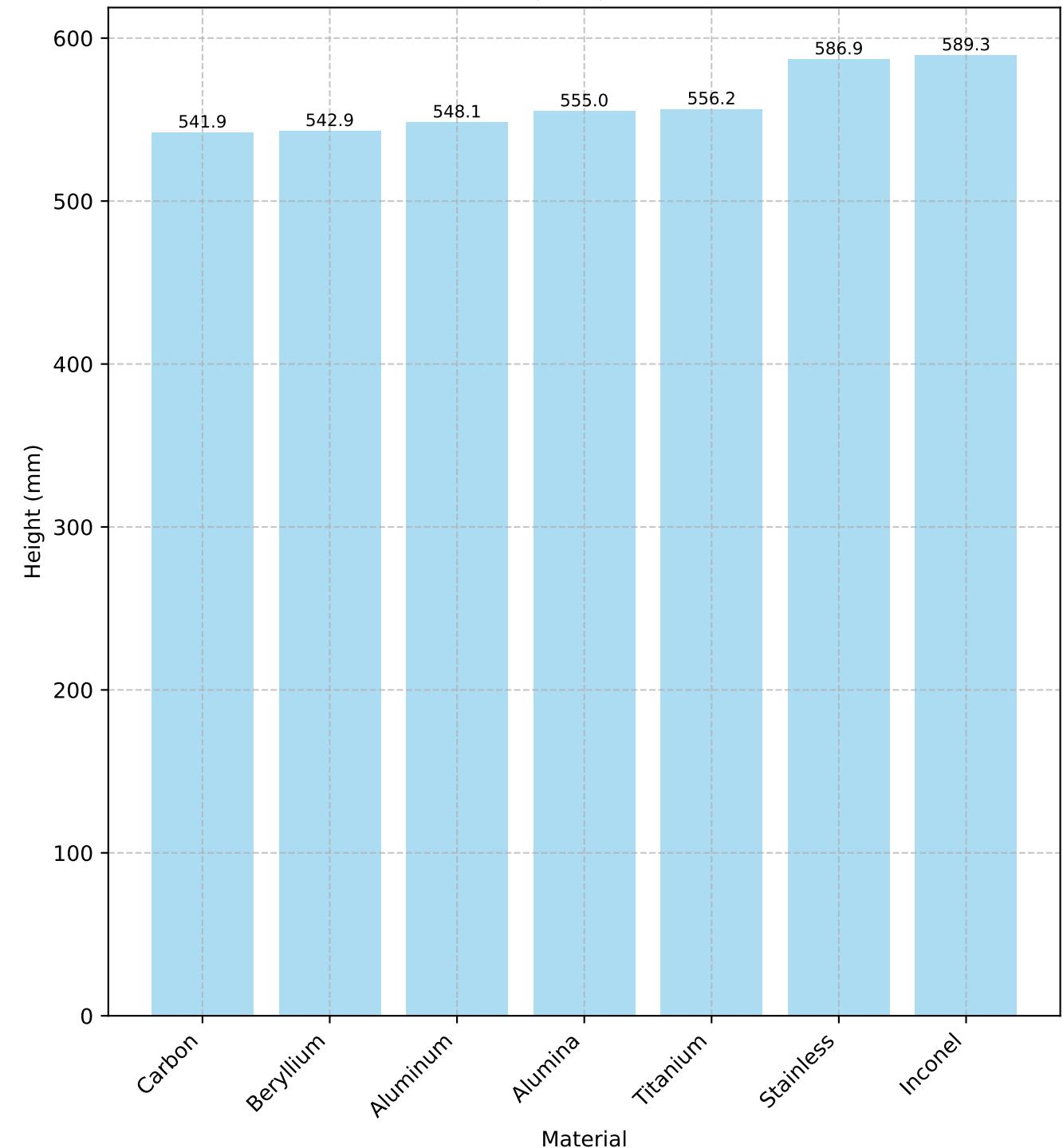


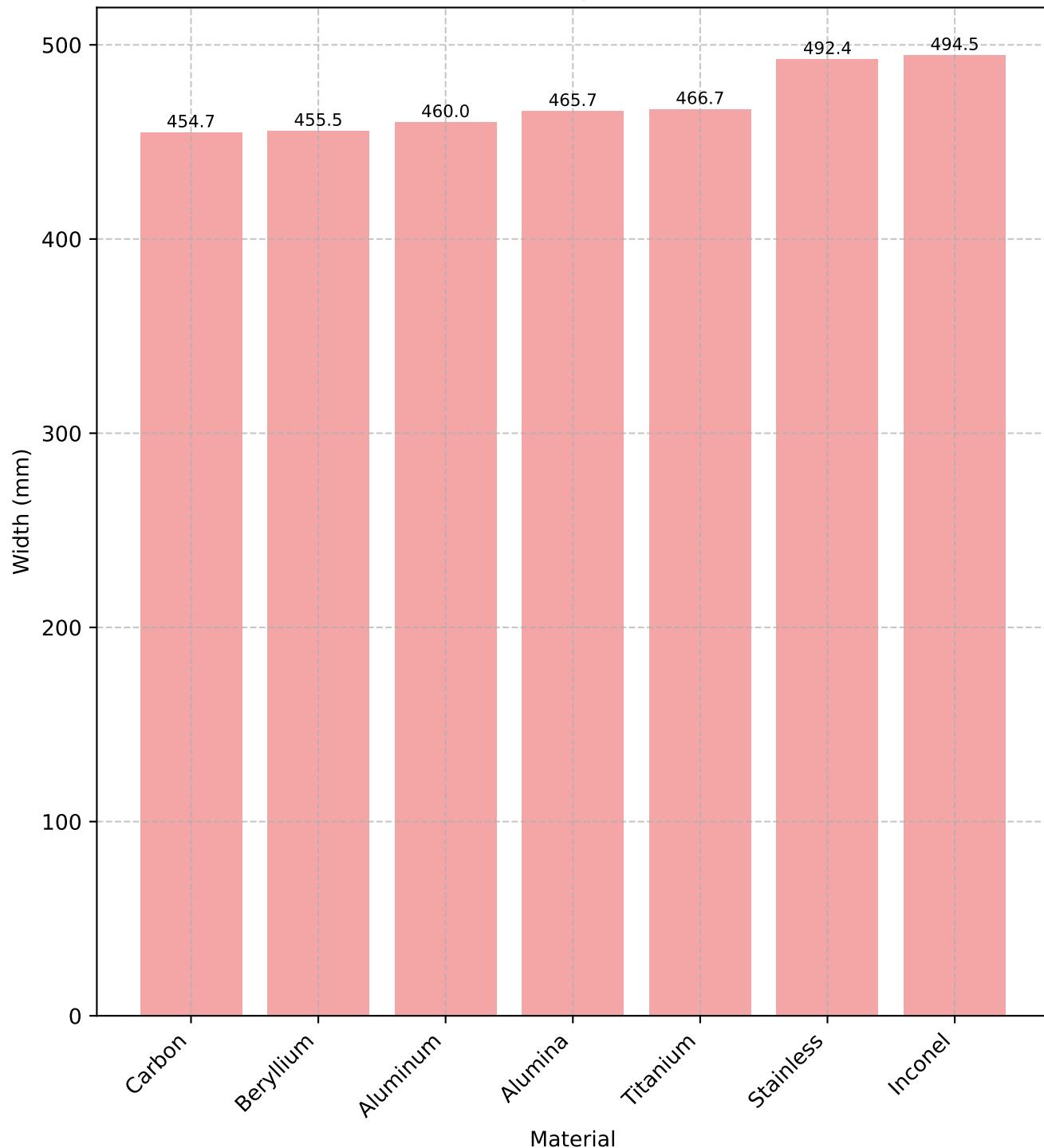
Material Properties Relationship (With Temperature Safety Rating)



Fin Height by Material



Fin Width by Material



INITIAL CONDITIONS AND PARAMETERS

MATERIAL COMPARISON SIMULATION

Generated: 2025-11-12 08:40:37

MATERIAL COMPARISON PARAMETERS

Comparison Mode: Fast
Number of Materials: 7
Mesh Size: Reduced

Materials Compared:

1. Aluminum 6061-T6
2. Alumina
3. Titanium Ti-6Al-4V
4. Stainless Steel 304
5. Inconel 718
6. Beryllium
7. Carbon carbon matrix composite

COMMON SIMULATION PARAMETERS

Time Step (dt): 0.01 s
Max Dynamic Pressure: 82800.0 Pa
Drag Coefficient: 0.5
ISP Sea Level: 235 s
ISP Vacuum: 300 s
Fuel Flow Rate: 4.4 kg/s

COMPONENT MASSES (USED FOR ALL MATERIALS)

| Component | Mass (kg) | Position (m) |
|--------------------|-----------|--------------|
| nose cone | 10.230 | 0.450 |
| fuselage_oxi | 55.330 | 4.500 |
| propellant | 244.080 | 3.000 |
| helium_tank | 43.500 | 1.400 |
| fuselage_shell | 60.250 | 4.000 |
| combustion_chamber | 12.830 | 5.500 |
| nozzle | 7.993 | 7.349 |
| fins (calculated) | 3.352 | 2.100 |