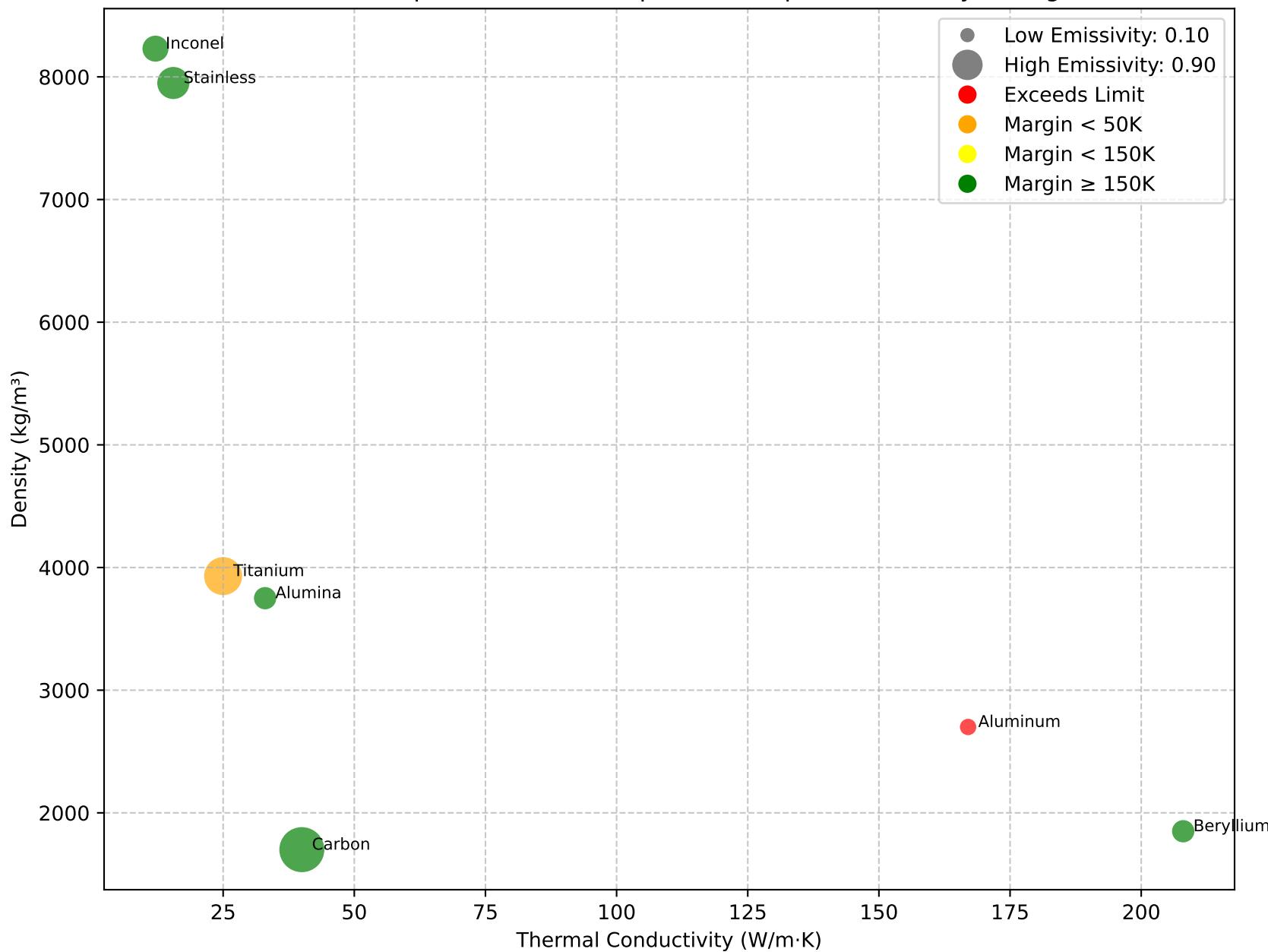
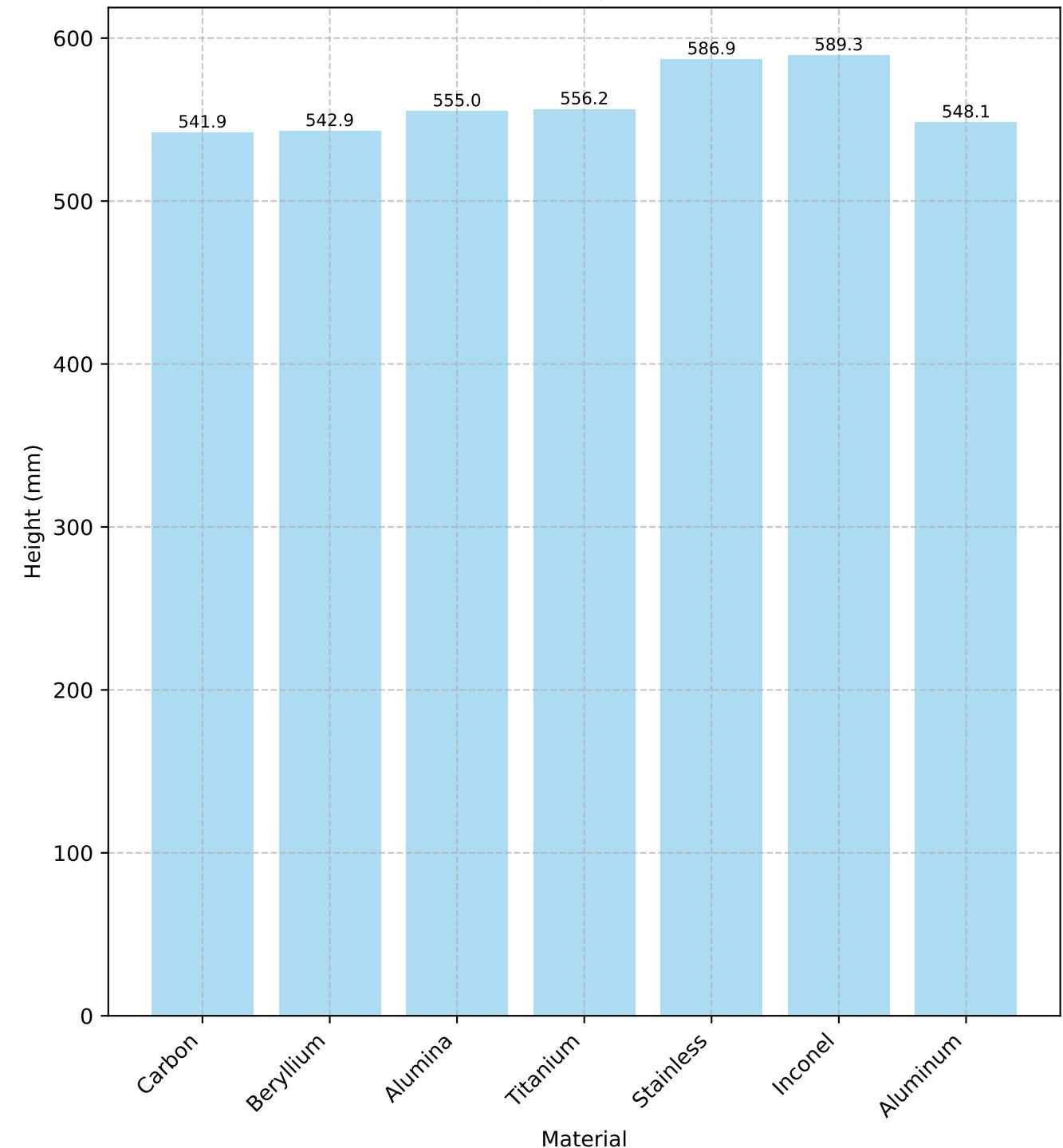


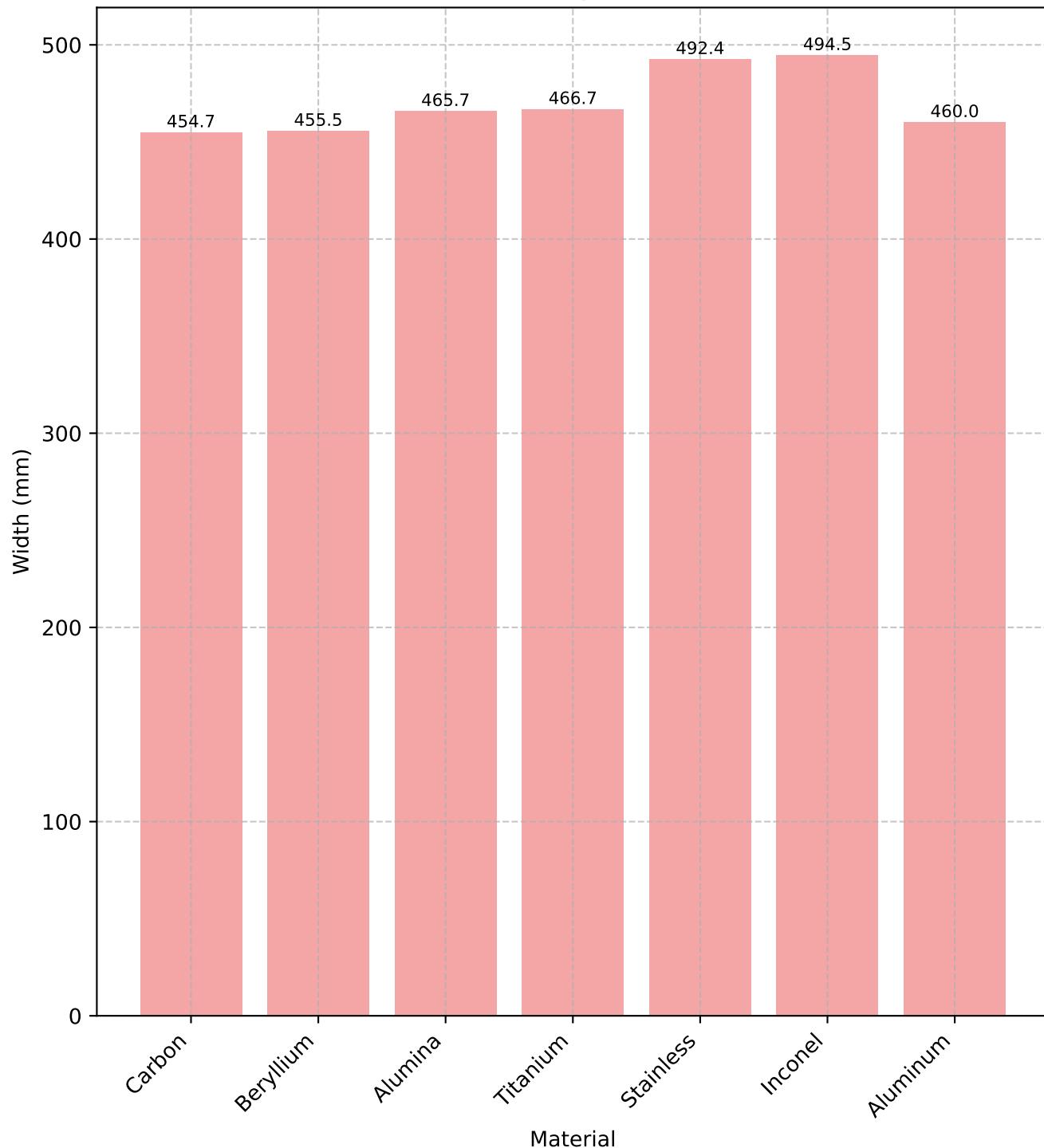
### Material Properties Relationship (With Temperature Safety Rating)



### Fin Height by Material



### Fin Width by Material



# INITIAL CONDITIONS AND PARAMETERS MATERIAL COMPARISON SIMULATION

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## MATERIAL COMPARISON PARAMETERS

Comparison Mode: Detailed  
Number of Materials: 7  
Mesh Size: Full

### 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