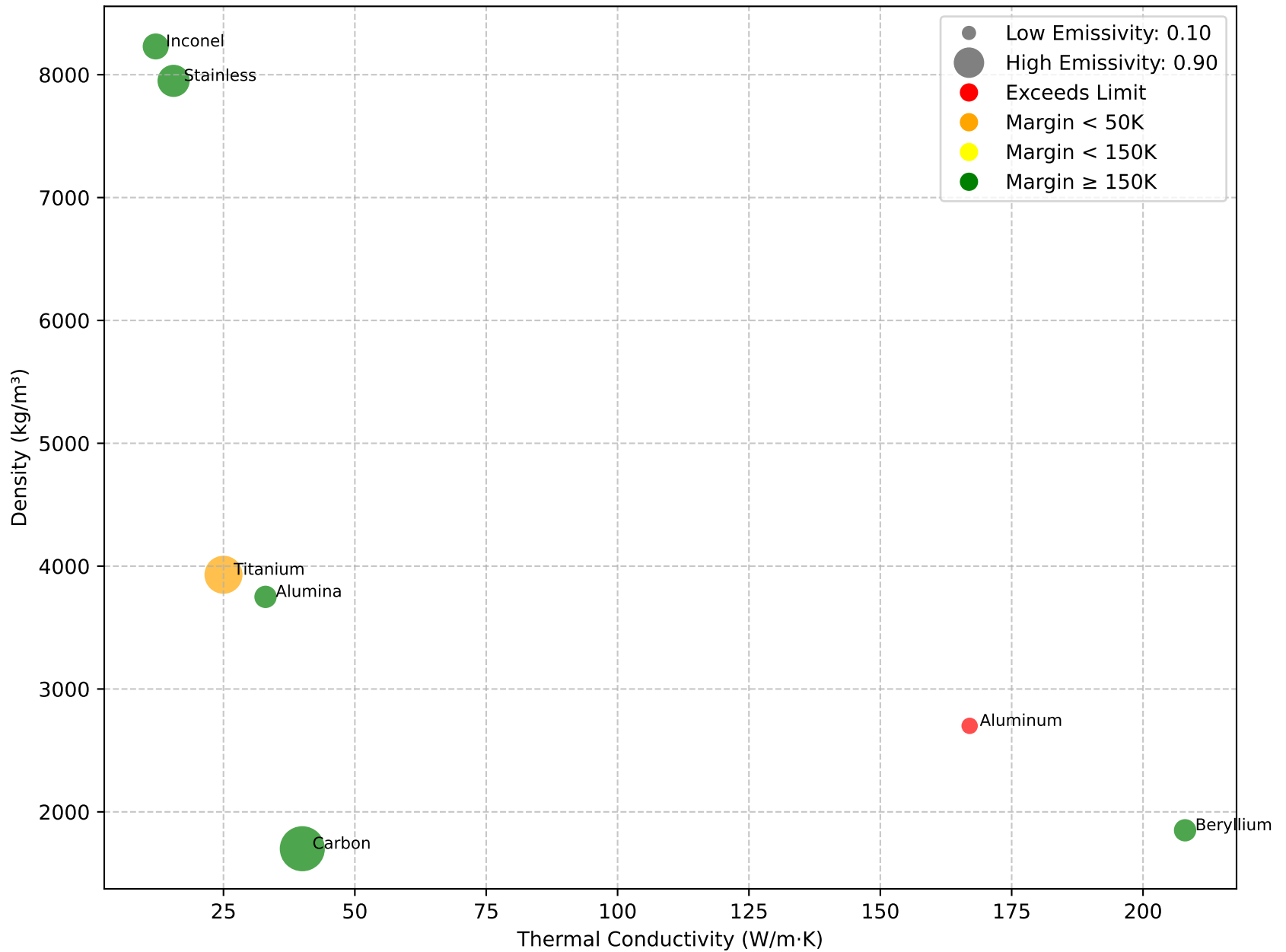
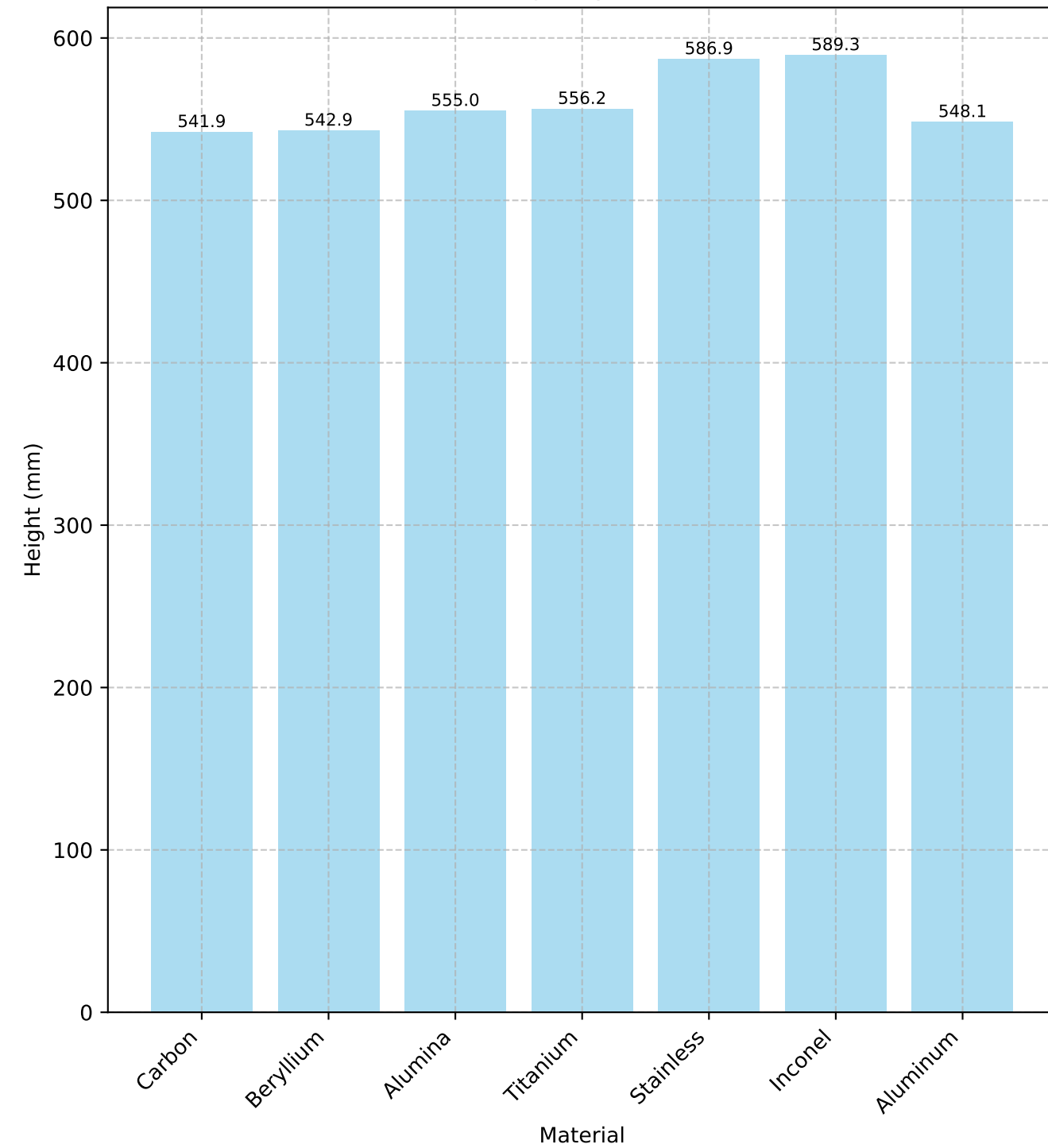


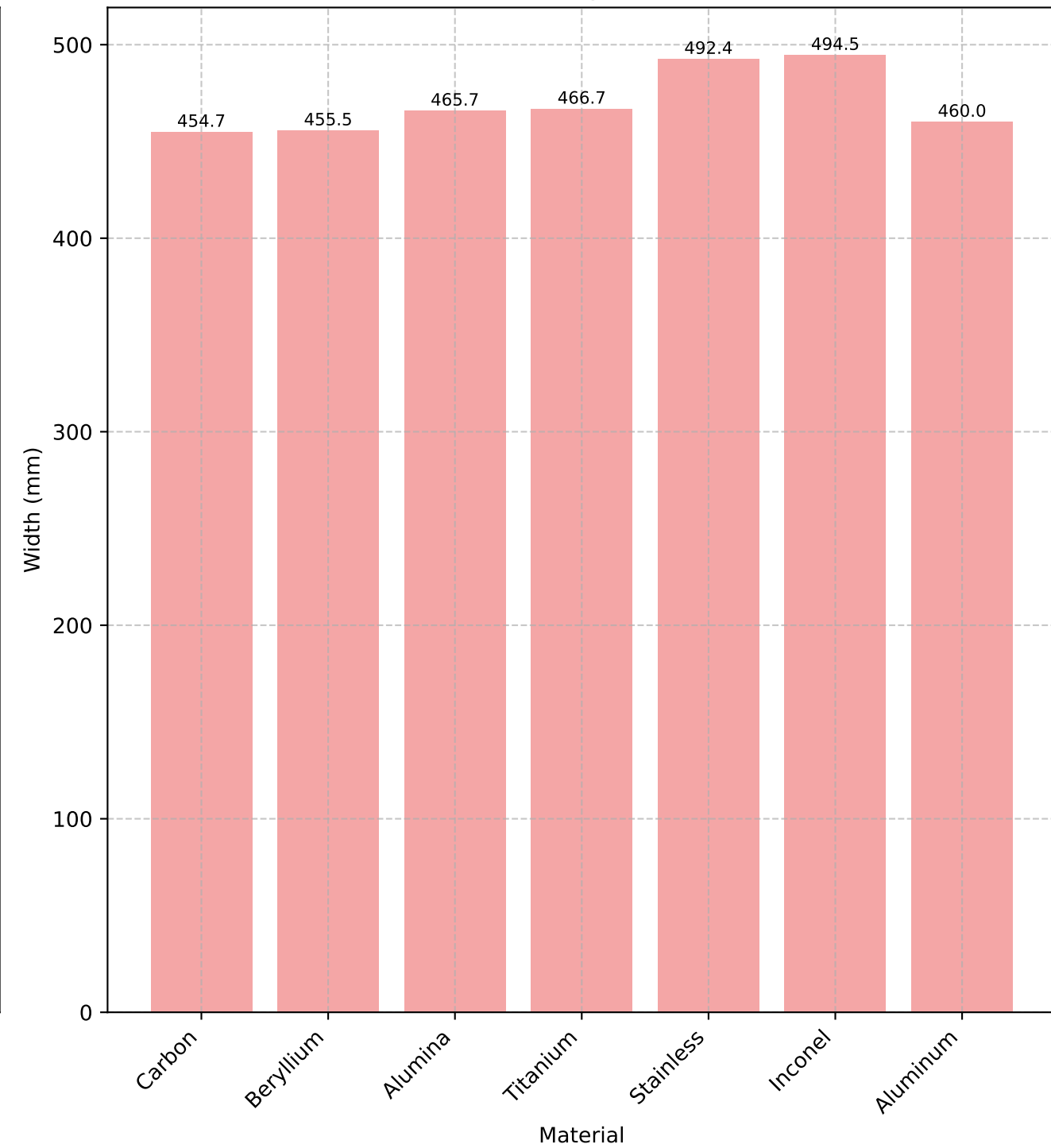
Material Properties Relationship (With Temperature Safety Rating)



### Fin Height by Material



### Fin Width by Material



INITIAL CONDITIONS AND PARAMETERS

MATERIAL COMPARISON SIMULATION

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MATERIAL COMPARISON PARAMETERS

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Comparison Mode: Detailed

Number of Materials: 7

Mesh Size: Full

Materials Compared:

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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

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COMMON SIMULATION PARAMETERS

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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

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COMPONENT MASSES (USED FOR ALL MATERIALS)

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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