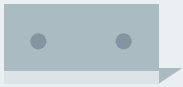


Engineering Metals & Alloys

Semiconductor packaging | precision fixtures | thermal and vacuum hardware



Aluminum

6061 / 7075

Lightweight fixture workhorse

Machined plates, stages, clamps, enclosures.

k ~167 / 130 | CTE ~23 W/mK, ppm/K

Excellent CNC; anodize if suitable



Copper

C101 / C110

Heat-transfer specialist

Heat spreaders, heated stages, busbars, cooling.

k ~390 / 390 | CTE ~17 W/mK, ppm/K

Machinable; oxidation and softness



Brass

C360

Precision-machining favorite

Small fittings, inserts, noncritical clamps, contacts.

k ~115 | CTE ~21 W/mK, ppm/K

Excellent CNC; leaded grade



Stainless steel

304 / 316L

Vacuum and corrosion hardware

Vacuum fixtures, chambers, fasteners, frames.

k ~16 / 14 | CTE ~17 / 16 W/mK, ppm/K

CNC; clean/passivate for vacuum



Titanium

Grade 2 / Grade 5

Strong, light, corrosion resistant

Special fixtures, low-conduction supports, fasteners.

k ~17 / 7 | CTE ~9 W/mK, ppm/K

Challenging CNC; galling risk



Kovar

Fe-Ni-Co alloy

Glass / ceramic seal matching

Hermetic package leads, headers, feedthroughs.

k ~17 | CTE ~5* W/mK, ppm/K

Seal-compatible finishes needed



Invar

36% Ni-Fe

Minimal thermal movement

Dimensional metrology fixtures, precision alignment.

k ~13 | CTE ~1-2* W/mK, ppm/K

CNC; temperature-range dependent



Molybdenum

Mo

Refractory package metal

Die attach carriers, high-temp fixtures, electrodes.

k ~138 | CTE ~5 W/mK, ppm/K

Brittle edges; specialty machining



Tungsten

W

Dense, high-temperature metal

High-temp contacts, electrodes, X-ray parts.

k ~170 | CTE ~4.5 W/mK, ppm/K

Very difficult CNC; grind/EDM



Nickel superalloy

Inconel 600 / 625

High-temp corrosion resistance

Furnace parts, hot tooling, aggressive environments.

k ~15 / 10 | CTE ~13 W/mK, ppm/K

Work-hardens; difficult CNC

FAST SELECTION: Heat: Cu / Al | Matched seals: Kovar / Mo | Low drift: Invar | Vacuum: 316L

Representative room-temperature values; grade and processing dependent. *CTE over limited specified temperature ranges.

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