

Material Selection for the Masses and Wires(2) (Revised)
 2011/11/30 Chihiro Tokoku

- Beryllium Copper (BeCu) ... health hazard
- Zirconium Copper (ZrCu) ... C15000 (Zr 0.12-0.2%) higher thermal conductivity than BeCu
- Silver Copper (AgCu) ... C10400 (Ag 0.027-0.034%), C10700 (Ag 0.085-0.102%) etc.

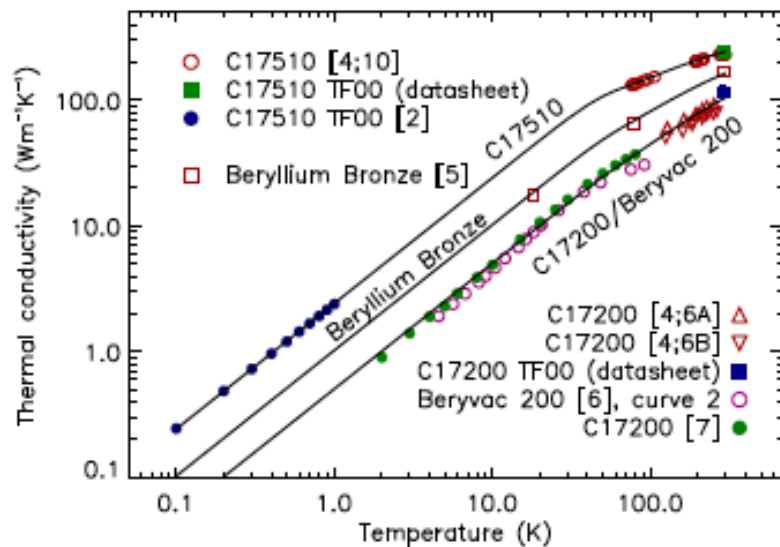


FIGURE 1. Measured thermal conductivity values for various dilute copper alloys (datapoints), along with fits using the equations from Ref. [3] (lines). References are given in square brackets; numbers following a semicolon identify different samples from a given reference.

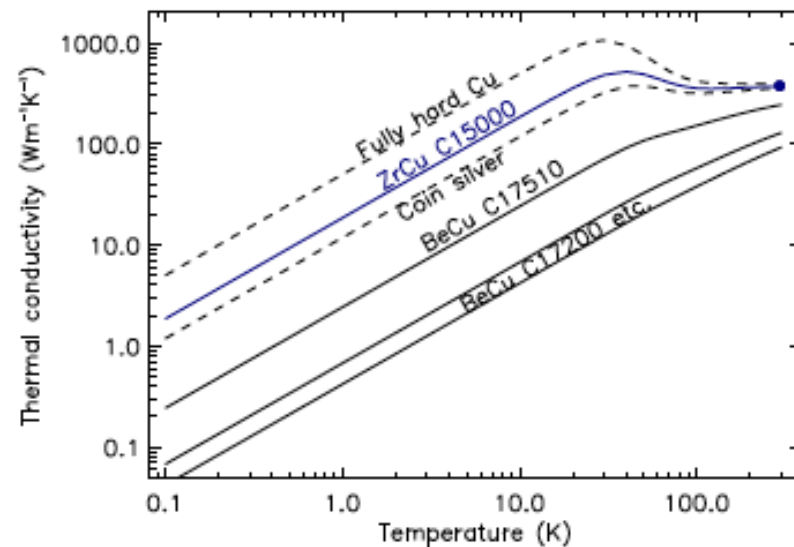


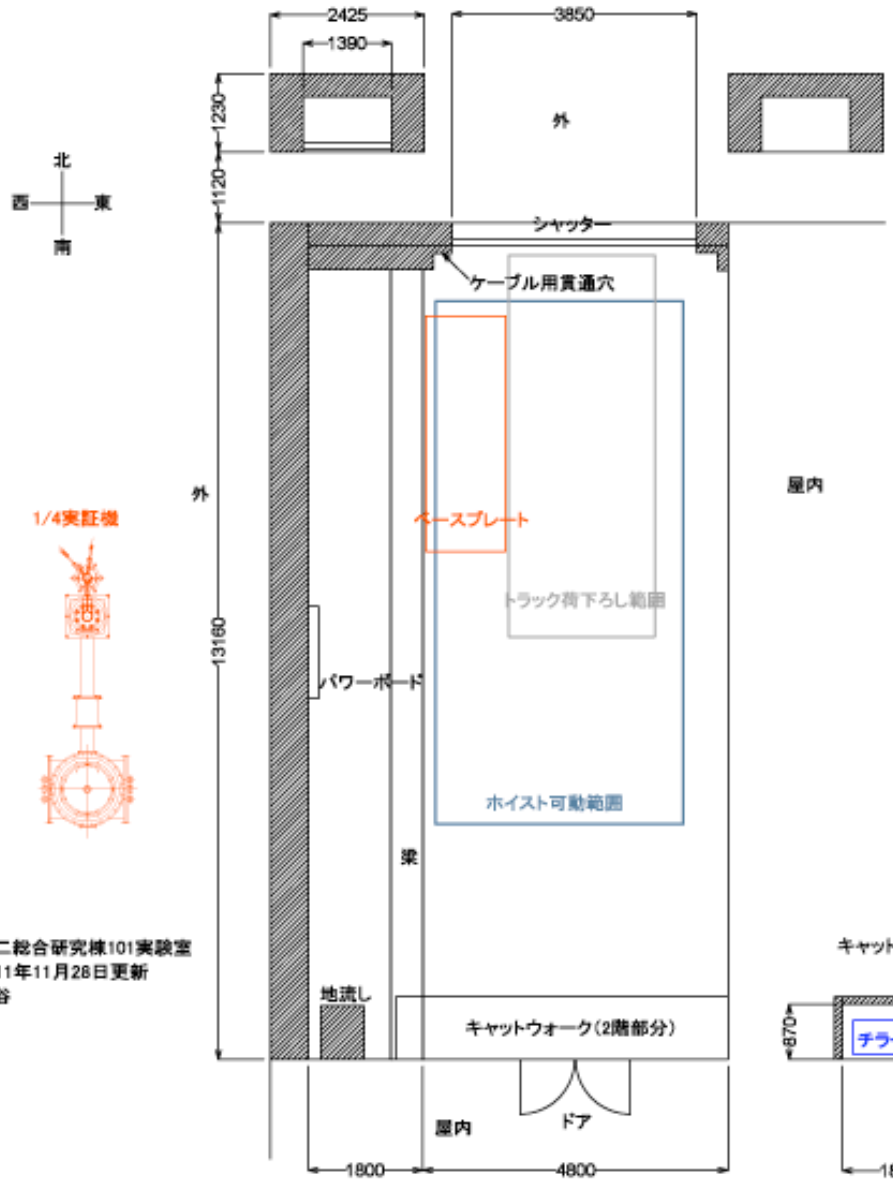
FIGURE 2. Recommended conductivity values for ZrCu and other coppers. Dashed lines are approximate.

with similar conductivity are also given in Fig. 2. The

Properties at Cryogenic Environment

	Density [E+3 kg/m ³]	Thermal Conductivity [W/m/K]	Young's Modulus [GPa]	Specific Heat [J/kg/K]	Resistivity [$\mu\Omega\text{m}$] (RRR)	CTE [E-6/K]	Machinability (Brass=100)
Oxygen Free Copper (C10100)	8.9	~2000@30K ~460@100K ~395@300K	120-130 (@20-300K)	96@50K 255@100K 389@300K	RRR>200-300	1.0@30K 10.7@100K 18.3@300K	20
Beryllium Copper (C17500)	8.25	130@300K	120-130 (@20-300K)	233@300K		17.5@300K	40
Tellurium Copper (C14500)	8.94	356@300K	120-130 (@20-300K)	385@300K	RRR~20		85
Zirconium Copper (C15000)	8.89	~390@20K ~370@100K 370@300K	120-130 (@20-300K)	394@293K	0.00132@4.2K 0.0183@300K RRR=13.8		20
Silver Copper (C10700)	8.94	388@300K				17.3@300K	20
Al6061-T6	2.71	71@60K 98@100K 159@300K	0.33@300K	~10@20K ~80@100K 960@300K	~0.02@20K ~0.04@300K RRR=2.7	24@300K	
Ti6Al4V	4.43	~2@20K ~5@100K ~10@300K	0.342@300K	~8@20K ~130@100K	<0.01@5K ~2@20K ~2@300K	8.8@300K	<10?
Silicon	2.33	2680@50K 884@100K 168@273K	Anistropic.	700@300K?		0.5@100K 1.5@200K 2.6@293K	

Preparing of Lab 101



第二総合研究棟101実験室
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