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26 February 2001

Heat Pipes from Thermacore (http://www.thermacore.com/)

Pipe is tube partially filled with 1/2 density copper wick and a few drops of a fluid. Cooling is by evaporation at hot end, condensation at cool end, and flow back down wick by "osmosis". Just about any working temperature can be achieved by choice of fluid and pressure. -10°C would use ammonia. Pipes are quite small (3 mm diameter off the shelf, 2 mm diameter can be custom ordered). One 3mm pipe can carry away ∼10 Watts with a temperature rise of ∼5°C from warm to cold end.

Bad news is that the copper wick does not stick well to aluminum (pipe without wick cannot cool against gravity) and they are reluctant to work with beryllium. Their standard pipes are stainless and copper.

Wall Material	Radiation Length (%)
beryllium	0.34
aluminum	0.70
stainless	2.7
copper	3.2
wick only	0.22

They have been generous with information and sent me three samples of 3 mm diameter, copper-walled pipes.

Planning to build a cooling mock-up with an aluminum support frame (eventually beryllium), CVD diamond layer, resistors to make heat, and heat pipe(s). Talking with Dave Christian on this. Questions: 1) How to make "massless" thermal link between diamond and pipe 2) How to arrange resistors to simulate heat load of pixels? 3) Frame dimensions?