

### COPPER/WATER HEAT PIPES

Copper/water heat pipes are made of copper, use water as the working fluid, and typically operate in the temperature range of 20 to 150°C. ACT manufactures copper/water heat pipes into basic geometries: Tubular Heat Pipes and Planar Heat Pipes. The tubular heat pipes typically have outer diameters from 1/16” (1.5mm) to 1.5” (38mm). Custom diameters can be manufactured per customer requirements. The planar heat pipes are also called vapor chambers which are used as heat spreaders. Below are photos of examples of copper/water heat pipes manufactured at ACT.

Copper/water heat pipe are often combined with other components to form heat transfer assemblies. Some examples are shown below, including: Heat pipe Heat Sinks for electronics and energy conversion device cooling, Embedded Heat Pipe Heat



**Examples of Tubular Copper/Water Heat Pipes  
Manufactured at ACT**

Spreaders for electronics cooling, and Heat Pipe Heat Exchangers for electronics enclosure cooling, waste heat recovery and chemical process temperature control.



**Heat Pipe Assembly Examples (from left to right): Heat Pipe Heat Sink, Embedded Heat Pipe Heat Spreader, and Heat pipe Heat Exchanger**

Current custom designs and options include:

- Outer Diameter (OD): From 1/16” (1.5mm) to 1.5” (38mm)
- Cross section geometry: Round, rectangular or flattened
- Length: Any, depending on application
- Length geometry: Straight or multiple bends (certain bend radius limits apply)
- Bonding of heat pipes to assembly: Mechanical, epoxy or soldering
- Heat pipe surface coating: Nickel, tin

All of ACT’s copper/water heat pipes are designed to survive numerous freeze/thaw cycles without any degradation as required in many applications.