

Thomas Heptode

Data Sheet

Type II: for use with other Microdrive systems

Technical data:

Core conductor material: platinum (95%) , tungsten (5%)
Insulation material: quartz glass
Tip shape: (D) only ground, Impedance 1-2M Ω
Connectors: Gold plated Amphenol sockets (female, 4021EFL)
 Gold plated Amphenol pin (male, 535EFL)
 Samtec socket (4060EFL)
 without connector (open end)

Other connectors on request!

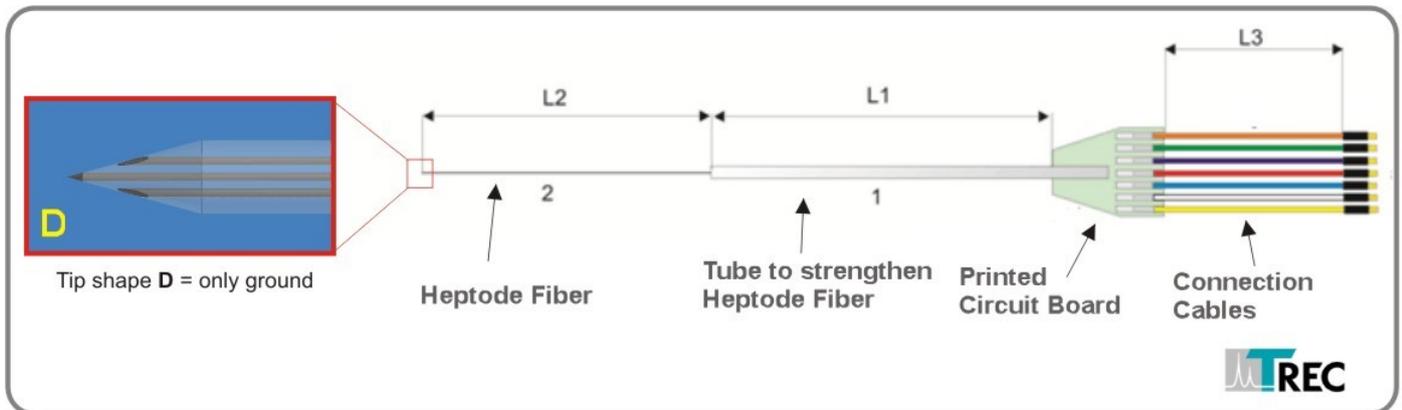


Figure 1: Thomas tetrode for other manipulator systems

Dimensions: L1 = Tube length / L2 = heptode fiber protrusion / L3 = connection cable length

Tube type: a) Metal tube, D=305 μ m (30gauge) / b) Metal tube, D=254 μ m (31gauge)
 c) Glass pipette, D=1.0mm / 1.5mm / 2.0mm
 d) Silica Tube D=170 μ m / 370 μ m

Article numbers: AN000150

Mechanical fiber stability

The mechanical stability of Thomas fibers electrodes is high. For fiber electrodes with 100µm outer diameter and 60mN axial force (which is approximately required to penetrate a dura mater) the buckling length of the fiber is app. 10mm. The higher the axial force the smaller is the buckling length. For example at 200 mN axial force the buckling length of a 100µm fiber is app. 6mm (for details see [1]). The max. fiber protrusion in a Thomas heptode is therefore $L_2=5-10\text{mm}$. Normal dura penetrations in small animals should be possible without any further guidance of the tetrode fiber.

For penetrating tough structures like the intact dura mater of a primate or for deep brain recording applications in primates we recommend the use of sharpened guide tube.

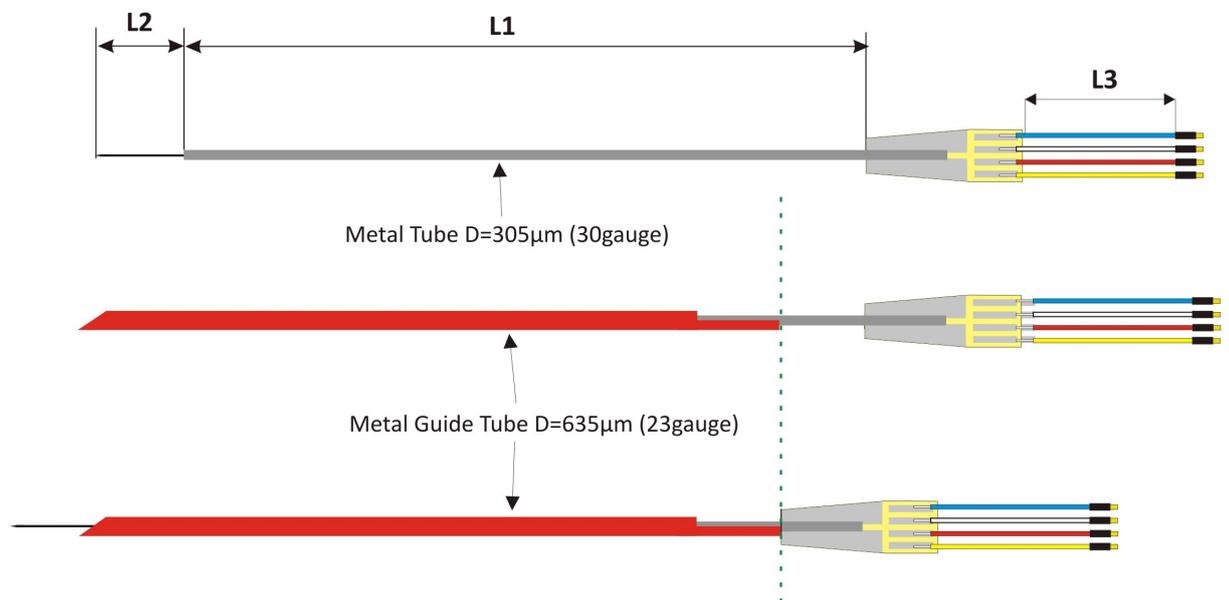


Figure 2: This drawing shows the Thomas heptode for other manipulators. For penetration of tough structures or for deep brain recordings in larger animals the use of a sharpened guide tube is recommended. The guide tube has a shoe shaped end so that heptode tip insertion is easily possible.

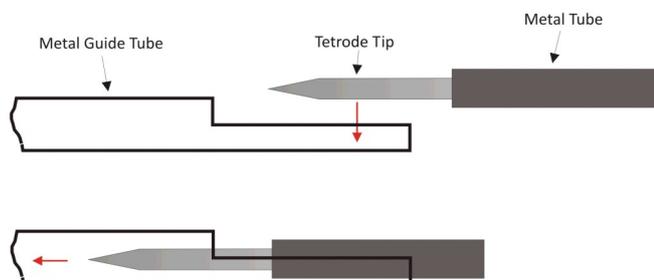


Figure 3: This drawing shows the shoe shaped end of the guide tube and how a Thomas heptode tip is introduced in this guide tube without damaging the heptode tip.

[1] Reitboeck HJ. Fiber microelectrodes for electrophysiological recordings. *J Neurosci Methods* 1983; **8**: 249-262