

# VITA34 Cooling Task Group

Flow Rates for a miniature blind  
mate coupler

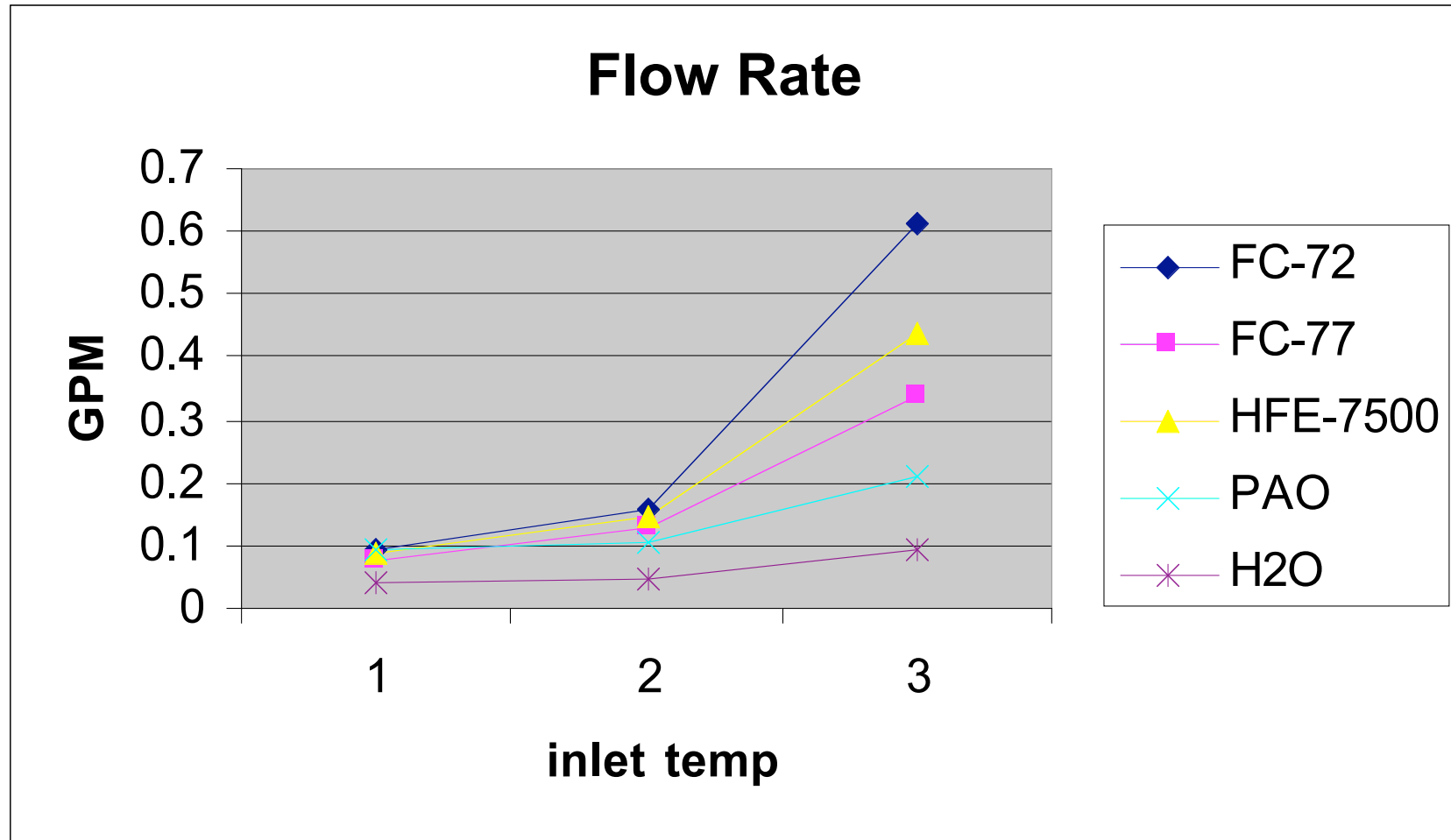
# Assumptions

- Module will dissipate 500 watts
- Pressure  $< 30$  psi
- Flow rate  $< 0.6$
- Coolant inlet temperatures 25 to 65 C

# Formula

- $q = mC_p(T_h - T_c)$ 
  - Where  $C_p$  is the specific heat ((J/kg)\*k)
  - $m$  is the mass flow rate
  - $T_h$  is the desired module operating temperature
  - $T_c$  is the inlet fluid temperature

# Fluid Flow Rates



# Conclusions

- The coupler appears to have plenty of reserve capacity.
- Economical Fluid to Air heat exchangers can be used.
- Only one inlet and outlet required for 500W
- Fully loaded rack w/2 7KW supplies requires 11.05 GPM worst case.
  - Power supplies need larger couplers (1.3 GPM)