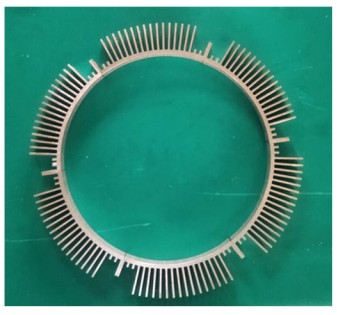
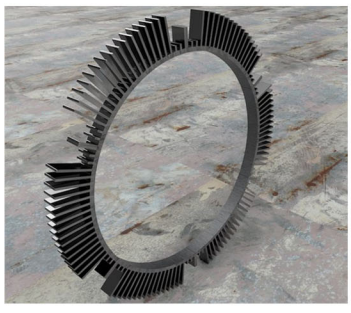
HubSink™ BETA

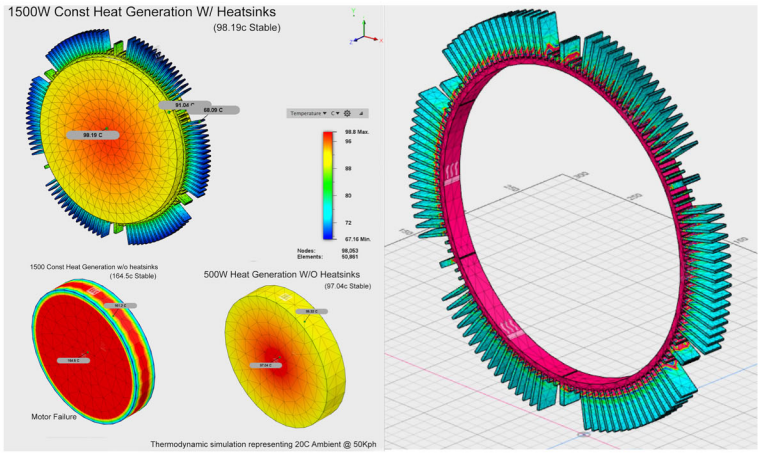
HANDLE MORE POWER, LONGER





IMPROVED HEAT DISSIPATION

Vastly improve the thermal management and power handling of hub motors with ~200% better overall thermal dissipation.



PREDICTING THERMAL PERFORMANCE

Calculated Thermal Resistance:
0.07 - 0.08 °C/W ~1100W @ 95°c 18kph

Heat transfer emissivity:
0.88 - 0.89 ε ~ 274w @ 95°c static

Approximate total heat dissipation:
1375w @ 18kph

HUBSINK STATS

6063- T5 aluminium

Thermal conductivity of 209 W/m-K
(Magnet ring Steel is 20-50 W/m-K)

Matte Black Anodised 0.12mm

CnC machined mating surface & Mounting hole

Complete weight with fixings, 385g-390G

Surface area ~2.1 sq ft

Sink Width	*= 15mm*
Sink Length	*= 697mm*
Fin Thickness	*= 2mm*
Base Thickness	*= 3mm*
Number of Fins	*= 128*

FAQ

Q: How much more power can i run?

(How much will my power density increase?)

A: There are too many variables to make any concrete assumptions on exact power handling in practice but for arguments sake if a MXUS with FF is overheating 15 mins into a ride because it's producing 2600W of excess heat under throttle and the hub can only shed 1500w, it looks like we can dissipate more than half of that excess to potentially let it be ridden in the exact same manner indefinitely with HubSinks.
This needs further testing, it could be more because keeping the temp lower earlier improves efficiency.
But thats why we're doing a Beta stage.

Q: Will it fit my motor?

A: The Beta version of the HubSink will fit any of the 'standard' hubs with a 222mm ØD Magnet ring and at least 18mm free space between spoke flanges, MXUS, QS 205, Leaf, Crystalyte, 9C et-al
(as a side note, thinner hubs like the 29mm stator MXUS will see a higher increase in thermal dissipation as a relative value)

Q: Do i have to remove my spokes to fit?

A: We designed the HubSink in 6 pieces so even on a 17" moto rim with 10a spokes, they should be easy to slide in then install.

Q: What if you paint it black?

A: Black anodisation will improve the emissivity factor from approx 0.09 to 0.89, so we did.

Q: What if you angle the fins 45°?

A: In testing the centrifugal action of the spinning hub pulls the air in from the sides and flings it out radially, as the hub is in a low pressure area inside the spokes you're better off putting a duct or a scoop to direct air towards the fins from the swingarm, although this has proven to be unnecessary.

Q: What if the fins were radial rather than axial?

A: Turbulent flow has a much higher rate of heat transfer than laminar, combined with the centrifugal action of the fins we have found this design to be the most effective.

Q: Won't these cause drag

A: The HubSinks are installed within the wheel behind the spokes and are only 40mm high on the upper rotating surface, and the lower is static in relation to the direction of travel, any drag will be negligible.

Q: Should i still run FerroFluid?

A: Definitely, the HubSinks dramatically increase the amount of heat dissipation, but FF creates the necessary thermal bridge to couple the stator to the magnet ring & HubSink, to see the full performance benefits.

**1 The impedance of a heat sink is measured in °C/W, which is the temperature rise of the heat source for each Watt of power dissipated. (HubSinks increase 0.8°C per Watt of heat dissipated at 18kph)*

**2 Emissivity represents a conversion of thermal energy into electromagnetic energy on a scale of 0(no emissivity) to 1 (perfect emissivity)*
(Hubsinks have a value of 0.88 - 0.89 dar to matte black anodising allowing them to shed ~274W at 95c)