



MISHIMOTO



ENGINEERING REPORT

2005–2012 Chevrolet Corvette C6 Performance Aluminum Radiator | SKU: MMRAD-C6-05

By Jason Wettig, *Mishimoto Product Engineer*

REPORT AT A GLANCE

- **Goal:** Create a radiator that outperforms the stock unit. The Mishimoto cooler should fit directly into the Corvette without any cutting or modification required.
- **Results:** The Mishimoto radiator showed a lower engine temperature of up to 5 degrees when compared to the stock radiator. The increased fin surface area promotes greater heat transfer and takes advantage of the limited airflow in the front of the C6.
- **Conclusion:** The Mishimoto radiator is a valuable upgrade for Corvette owners who drive their vehicles on tracks or in hot climates. The upgraded heat exchanger helps to ensure coolant temperatures stay at optimal values during all driving conditions.

CONTENTS

PG	1	— DESIGN OBJECTIVES
		— DESIGN AND FITMENTS
PG	2	— PERFORMANCE TESTING

DESIGN OBJECTIVES

The design requirements assigned to this project are as follows:

- Create a radiator package that reduces fluid temperatures when compared with the stock configuration.
- Must be a direct fit, with no cutting or permanent modification necessary.

DESIGN AND FITMENTS

The R&D process began by evaluating the stock system and understanding how the Corvette team chose to package the cooling stack. Before the core could be increased in size, a general understanding of the allotted space was needed. There was a fair amount of room behind the stock fan shroud. By testing airspeed through the stock core, it became apparent not a lot of airflow was getting to the core. Knowing that with such little air flow a super thick core would yield diminishing returns, a 2” core was chosen. GM placed the stock core on an angle to allow for a slight increase in surface area for heat transfer. Since too tight of a fin pitch and fin height would cause the air to simply glance off the radiator, a slightly looser fin pitch and tube height were chosen. The chosen

fin pitch and height are still tighter than the stock component, which will yield better heat transfer.



FIGURE 1: The Corvette C6 radiator mounted in the car.

The Mishimoto Corvette C6 radiator increases fluid capacity by 45.45% when compared to the stock C6 radiator. The radiator is slightly thicker and has more rows, therefore it can hold more fluid. Figure 2 below shows the fluid capacity comparison between the stock and Mishimoto radiators.

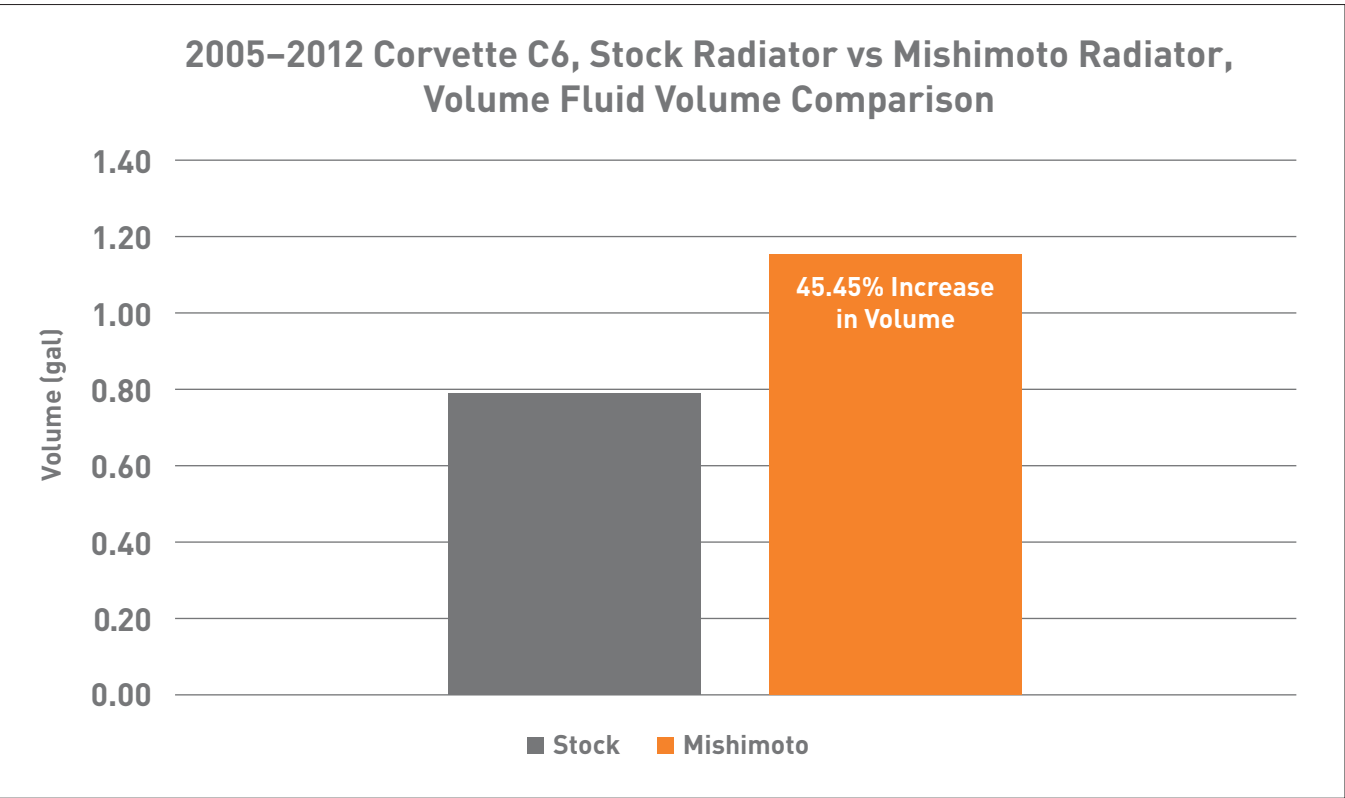


FIGURE 2: The Mishimoto radiator features an increase in coolant capacity, which promotes greater heat transfer.

The Mishimoto Corvette C6 radiator also increases fin surface area by 56.5% when compared to the stock C6 radiator. With the thicker core and more rows, the result becomes a larger amount of fin surface area. Figure 3 displays this difference between the stock and Mishimoto radiators.

PERFORMANCE TESTING

The C6 was hooked up to our dyno packs and placed under heavy load with thermocouples placed in the inlet and outlet hoses on the radiator. The first of two tests were performed. The first test was a

steady-state test. The car was warmed up and then run to simulate driving at 70 MPH. The second test was designed to simulate a race circuit. The car was placed in one gear and the dyno packs were programmed to adjust the load to simulate different RPM ranges. By programing the dyno packs to change RPM over a specified segment of time, the car was put under similar loads to that of a race circuit. This simulation really pushed the car to its limits and gave an accurate representation of racing the car. The ambient temperature was approximately 70°F (21.1°C) with 55% humidity. An AEM datalogger was used to record the race program results, which can be seen in Figure 4.

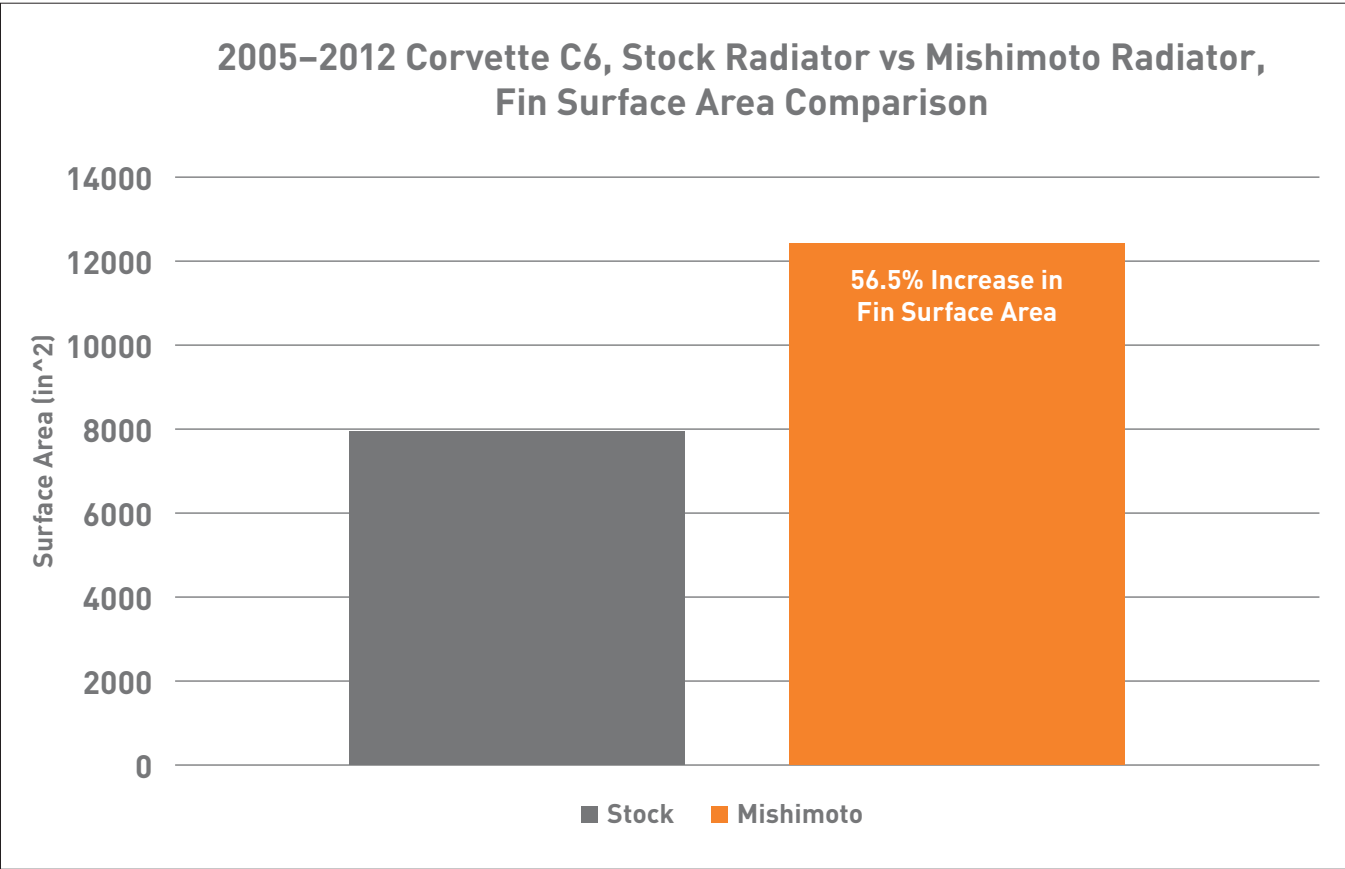


FIGURE 3: The Mishimoto radiator features an increase in fin surface area, which promotes greater heat transfer.

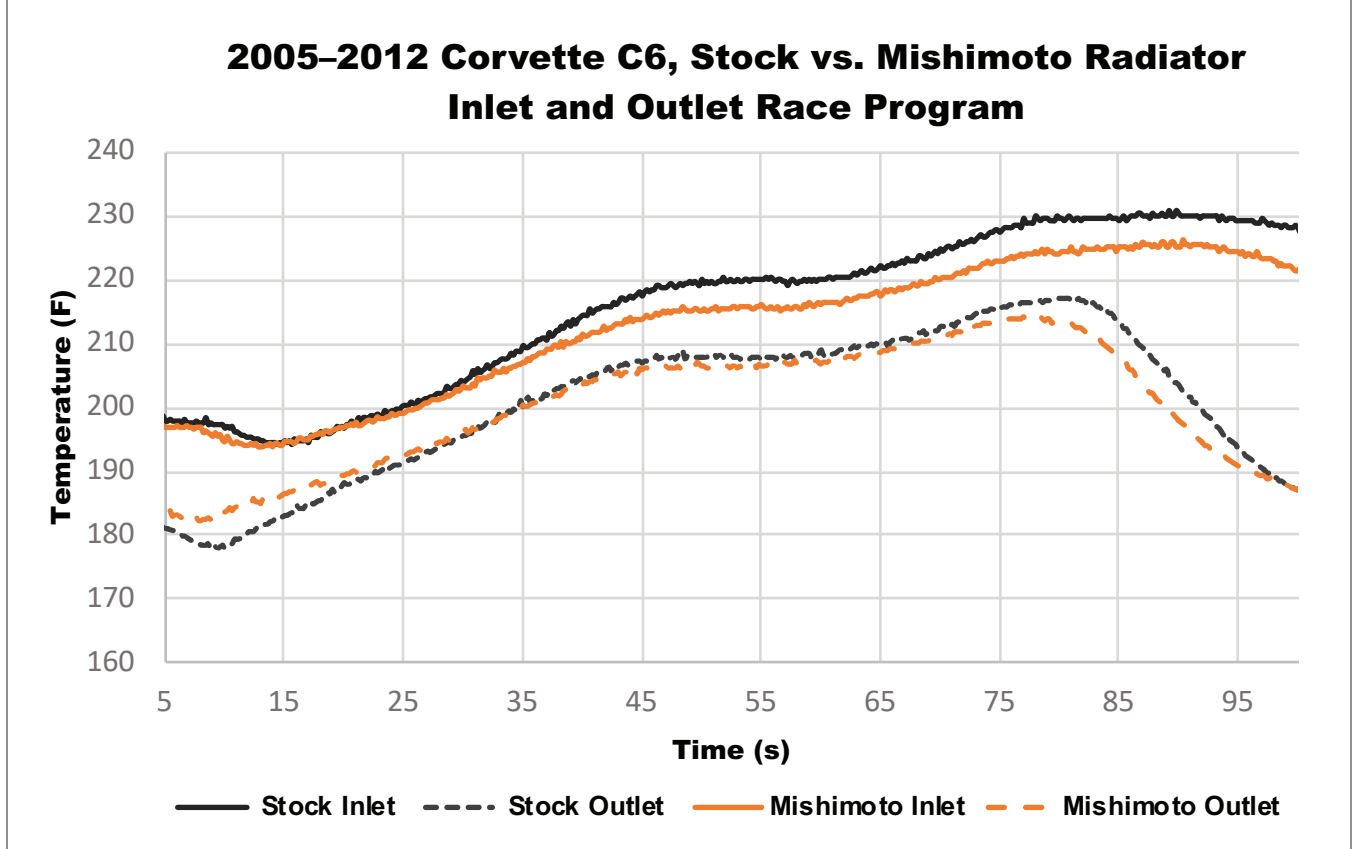


FIGURE 4: *The stock radiator and Mishimoto radiator were tested using the same technique. Mishimoto’s core showed an increase in heat transfer when compared to stock.*

As seen in Figure 4, the Mishimoto core outperformed the stock core by lowering engine temperatures by 5°F. The new Mishimoto Performance Radiator for the C6 Corvette was designed to decrease coolant temperatures without taking up too much precious space in the engine bay. This radiator lowers coolant temperatures, has increased fluid capacity, and features a more durable all-aluminum construction. All these features will help your C6 Corvette perform better when driving in hot weather or under track conditions.

Jason Wettig
Product Engineer, Mishimoto Automotive

