What is a high efficiency core?

CLASSIC RADIATOR

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If your radiator needs to be replaced and you want to retain as much originality as possible then recoring your original copper radiator is only one of the choices available to you. Whether it will be recored or replaced with an entirely new radiator, the cooling can be upgraded with a high efficiency radiator core. A copper radiator core can be made more efficient by changing the tube spacing and fin count. The radiators that were made from the 1950's to the 1970's generally used ½" wide tubes placed on 9/16" centers from each other. If you counted the fins you might get as few as 6 or 8 fins per inch (FPI). If the tubes are placed closer together and the fins are packed in tighter a denser core is created that throws off much more heat. A high efficiency core can have tubes on 7/16", 3/8" or even 5/16" centers and fin counts increased to 12 to 14 FPI. That may not seem like a big deal but the surface area is greatly increased. As an example; a 26" wide downflow style radiator with tubes on 9/16" centers has about 45 tubes from side to side. A high efficiency core of the same width has 57 tubes from side to side. Combined with all the additional fins between the tubes this provides approximately 20% to 25% better cooling than the OEM radiator had.

A three-row high efficiency core will cool about the same as a regular four row without taking away another 5/8" of fan clearance. Going to a thicker core will cool better but there is one big thing to remember. As the air passes through each row of tubes it is picking up heat along the way. The air cools off each following row of tubes a little less than the previous rows. A four row core is of course better than a two row core but increasing a cores thickness does not necessarily mean it will continue to get more efficient as it gets thicker. As I said earlier a core that is too thick will also impede the airflow at low speeds.

A four row copper core with ½" tubes on close centers (High Efficiency Design) will cool slightly better than an aluminum radiator with 2 rows of 1" tubes on close centers. It will weigh quite a bit more and will likely cost more depending on the current market but will be easier to repair and will maintain the original appearance under your hood.

Upgrading to a high efficiency core when replacing your radiator can be money well spent. The ethanol in today's gasolines will make a perfectly rebuilt engine in a classic car run hotter than it did when new. Adding air conditioning or more horsepower to your engine will require additional cooling that an exact replacement core will likely not provide. The decision over which to use in your particular case comes down to what is more important to you. Appearance, originality, durability and cost all need to be considered before you make your decision. The additional cooling could make the difference between cool cruising and overheating on a hot summer day.

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Regular Core design vs High Efficiency Core design
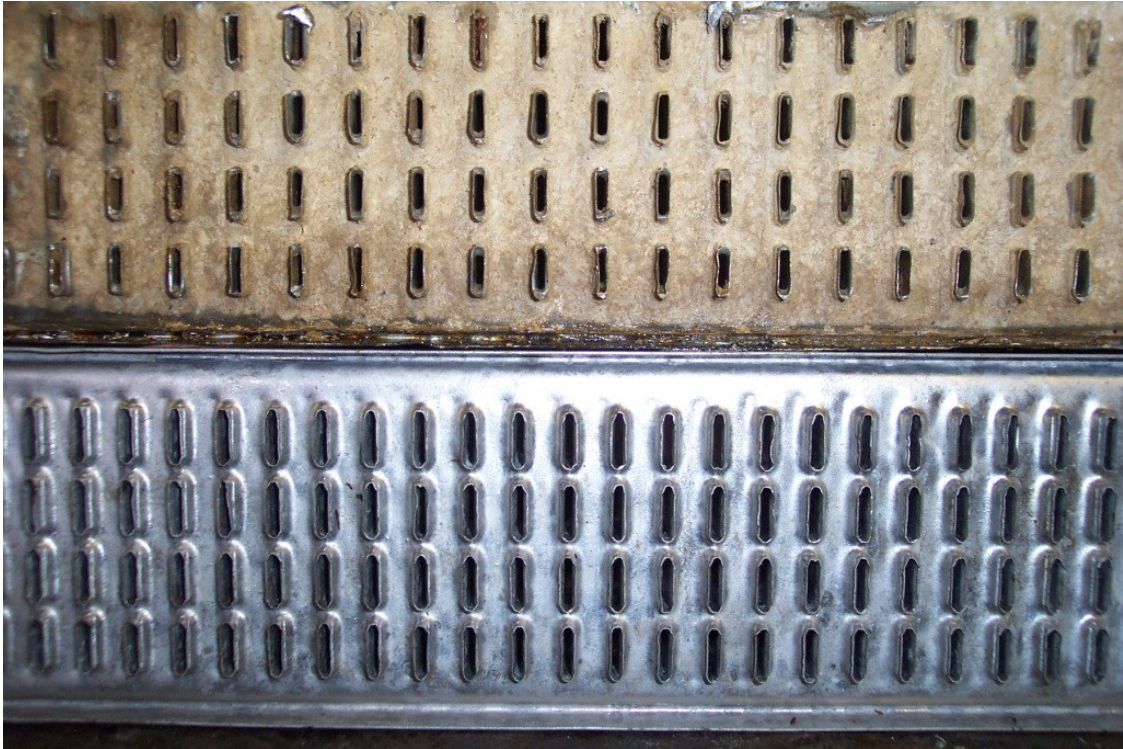
The top core is a standard tubular radiator core with tubes on 9/16" centers. The high efficiency core on the bottom has tubes on 7/16" centers. Some manufacturers make their high efficiency cores with the tubes on 3/8" centers or even 5/16" centers. The 7/16" pattern gives about 20% more tube surface area than a core with the 9/16" tube pattern. Combining closer tube spacing with a closer fin per inch count will give better heat transfer without increasing the thickness of the core.

  An example of this would be that a high efficiency 3 row core will cool the same as a regular 4 row core without adding the extra thickness of the fourth row of tubes. This can be critical where fan clearance is an issue or the tanks are not wide enough to accommodate a thicker core.

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