Let’s talk straight fin

Here’s a refresher on the various straight fin radiators manufactured in our industry (and of course those made by CHE).

1. SG Radiator

The most common known straight fin radiator is the SG system - for those not in the know it means “straight- german “. The terminology was introduced when the first machines designed for aftermarket manufacturing were brought to South Africa in the early seventies from Germany.

SG specification:
- Tube size: 13.6 x 2,6 mm
- Tube pitch: 10 mm
- Fin pitch: 2.2, 2.5, or most commonly 3 mm (also multiples such as 4.4, 5, 6, etc……
- No. tube rows: 2, 3, 4, 5, 6, 7, 8

2. AT Radiator

This is the “angled tube” radiator employed originally in Caterpillar products. The concept of the angled tube was to facilitate self-cleaning, as the air would flow through the radiator core and speed up, slow down, speed up, slow down…etc. as the air travelled through the core (air speed increases as the path narrows, similarly air speed decreases as the path opens under constant pressure). This radiator is generally manufactured with a relatively thick steel fin (nearly 3 times the thickness of the copper fin), so the radiator is protected from sand blasting and other nasty elements in the air. Some manufacturers can use a copper fin for the angled construction, but is generally lesser required.

AT specification:
- Tube size: 13.6 x 2,6 mm
- Tube pitch: 15.88 mm
- Fin pitch: 2.2, 2.5, or most commonly 3 mm (also multiples such as 4.4, 5, 6, etc……
- No. tube rows: 2, 3, 4, 5, 6, 7, 8

3. SH System

This type of radiator is a derivative of what was known as the “Young” system in South Africa. Exactly where the name stems from I do not know, but the system was well known in it’s heyday – the times before the corrugated fin was introduced and straight fins ruled in a all vehicles and applications.

The main difference in this system is the large tube employed, a 19 x 2.2 mm tube. The surface area for the tube is relatively large and the water has a larger contact area with the tube than the smaller tube’s. For various applications therefore the Young system was used.

SH specification:

Tube	size:	19 x 2.2 mm
	pitch:	9.5 mm
Fin	pitch:	2.2, 2.5, or most commonly 3 mm (also multiples such as 4.4, 5, 6, etc……
No. tube rows:		2, 3, 4, 5, 6, 7, 8

4. DTF System

The “double tinned fin” system stems from the industrial use of the SG system, where it was sought to have a radiator stronger and a better performer (or alternative to) to the AT system. Here the fin spacing is often enlarged to 6mm, but instead of a single fin, 2 single fins are utilized on top of each other. This means that the same amount of fins is used than in the normal SG core, but at double spacing. As a measure for strength, the fins are then coated with solder paint in order to give strength to the fins. Our conditions in South Africa call for regular cleaning in industrial applications. Generally this is done with a steam cleaner or high-pressure cleaner, and the normal fins are not strong enough to withstand this direct “blast” of water or steam. The fins then tend to bend over, further impairing airflow through the radiator, enhancing clogging and over-heating.

The negative aspect of this method is that the solder paint will form a “wall” resistance to the airflow, and the gains made by enlarging the fin pitch can be lost due to clogging between the fins.

At **CHE**, we have improved on this system by rolling both fins into one. This means that the hem of the fins is rolled over both fins, giving the appearance of a singular thick fin. Only from the side can it be seen that the fins are actually 2 separate fins. Improved airflow over this type of fin will ensure improved heat transfer.
Further improvement on the DTF-CHE system is the utilization of solder electroplating on the fin. This means a uniform film of solder is applied to the fin material before the fin is made. When the core is then backed in the oven, the solder between the fins will ensure a strong “singular” fin, with uniform solder ensuring enhanced heat transfer abilities in comparison to solder-painting of cores with separate fins..

5. EEF System

This is a new system and is our further development of the DTF system. We have realized that the fin is not required to be double throughout, but the edges need to be given the thickness of the double system to ensure strength. The “Edge Enforced Fin” system has the obvious advantage of the leading edge to be strong enough to withstand the elements, but the rest of the core to be as a standard core, with heat transfer abilities very close to the DTF-CHE system, in my opinion a negligible difference. Note that the leading edges have a hem that is 4 times the material thickness, the same as in the DTF system, and double material is led into the first row of holes giving strength right through to the tube. This type of system will give the required strength against the cleaning done without bending the fin over.
Needless to mention the obvious price advantage……..