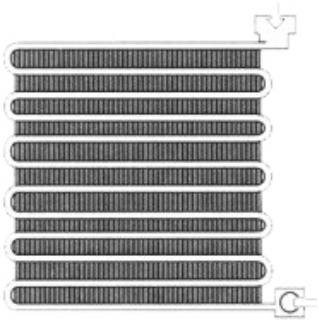
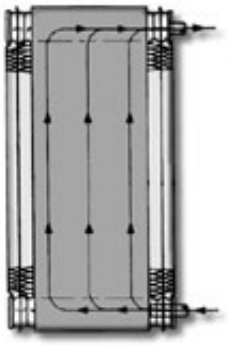
FAQ: EVAPORATOR DESIGNS?

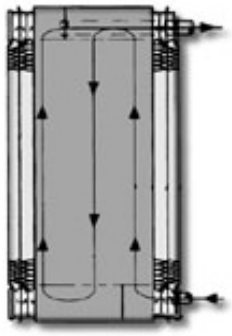
CHARACTERISTICS AND ISSUES WITH EVAPORATOR DESIGNS



◄ A “Tube & Fin” and even the small amount of parallel paths in a “Serpentine” design Evaporator, in general, has not proven to be difficult to clean. One single pathway limits the ability for much debris to accumulate and flushing of these types of heat exchangers has always been very successful. In automobiles, this design has mostly been abandoned for more compact and efficient designs.



A “Single Pass” Evaporator ► also known as an “Open Chamber” consists of a lower and upper “tank” or “well” connected with vertical tubes or multi path plates. This is a very commonly used design with the basic Orifice Tube (OT) system and has been used in many automobiles for many years for its evaporation efficiency. Be aware that flushing chemicals can pool in the lower “well” area.
(see FAQ: Flushing Evaporators?)



◄ The “Multi-Pass” or “Parallel Flow” Evaporator is today’s most common Evaporator design. It is favored for its compact and lightweight design, while providing for high evaporation efficiency. The compact design has allowed for the Evaporator to move to the other side of the firewall (in the dash) to fit with today’s compact car designs. Multi-tube parallel flow plates are attached at each end with common chambers that direct the flow through to the next plate back and forth or up and down creating what are known by the number of direction changes to be a 2 pass, 3 pass, 4 pass, etc. Parallel flow heat exchangers require high velocity and agitation to overcome the “path of least resistance” rule and perform effective cleaning. Be aware that the header chambers will also trap flushing chemicals. (see FAQ: Flushing Evaporators?)

Failure to understand the issues associated with the different Evaporator designs and completing the flushing process properly has created a lot of unnecessary hype and concerns about “Residual Solvents”. A highly evaporative flushing chemical must be used for flushing followed by a generous dry air purge, nitrogen purge, or vacuum recovery process to evaporate and remove the residual solvents. Failure to remove residual solvents will dilute the new refrigerant oils.

“Residual Solvents” are NOT a problem created by FLUSHING!

FACT: “Residual Solvents” are a problem because of the following issues:

- Many Technicians are lacking the necessary training and understanding of internal component designs, the inherent issues, and taking the necessary steps to overcome these issues.
- Marketing by trusted Name Brands of poor performing flushing chemicals with limited evaporative qualities.
- The widespread use and promotion of inexpensive and poor performing flushing methods such as aerosol can cleaners and 1 qt. pressure pots using OSHA regulated low flow blow guns. These products lack effective cleaning velocity, solvent volume, and a method to perform the critical solvent purging or recovery.