Hydraulic Case Drain Cooling

Maintaining a normal oil temperature in all hydraulic systems is important for successful system operation. High hydraulic fluid temperatures can damage system components, as well as significantly alter the way your hydraulic system performs leaving you with costly repairs and downtime.

In addition, hydraulic fluid temperatures above 180°F (82°C) damage most seal compounds and accelerate degradation of the oil. While the operation of any hydraulic system at temperatures above 180°F should be avoided. For every 18-degree increase in temperature above 140 degrees, the life of the oil is cut in half. Systems that operate at high temperatures can produce sludge and varnish, which result in the damage to the hydraulic system as well reduce efficiencies of the application.

A pressure-compensating piston pump is the most commonly used type in industrial hydraulic systems. Tolerances allow for a small amounts of oil to bypass through and flow into the pump case, and then be ported back to the reservoir through the case-drain line. Case-drain flow does no useful work and is converted into heat.

Often in hydraulic systems, hydraulic motors and pumps run case drain hoses. The reason for this is to drain excess internal oil leakage from the motor. If no case drain line is installed then the result will be a blown shaft seal or damaged housing. Running a case drain can also assist with cooling, and also lubrication of the motors in some instances. Always check the manufacturer's specification on maximum outlet and case pressures for correct installation.

A normal flow rate out of the case-drain line is 1% to 3% of the maximum pump volume.

Case drain coolers are ideal for applications requiring minimal cooling, such as a case drain line on a Hydraulic Power Unit (HPU). These type of coolers offer minimalist mounting intended to reduce installation time. These cooler mount behind an existing TEFC motor utilizing the electric motor fan air flow. This cooling set-up is compact, low cost, low flow with minimal heat removal.

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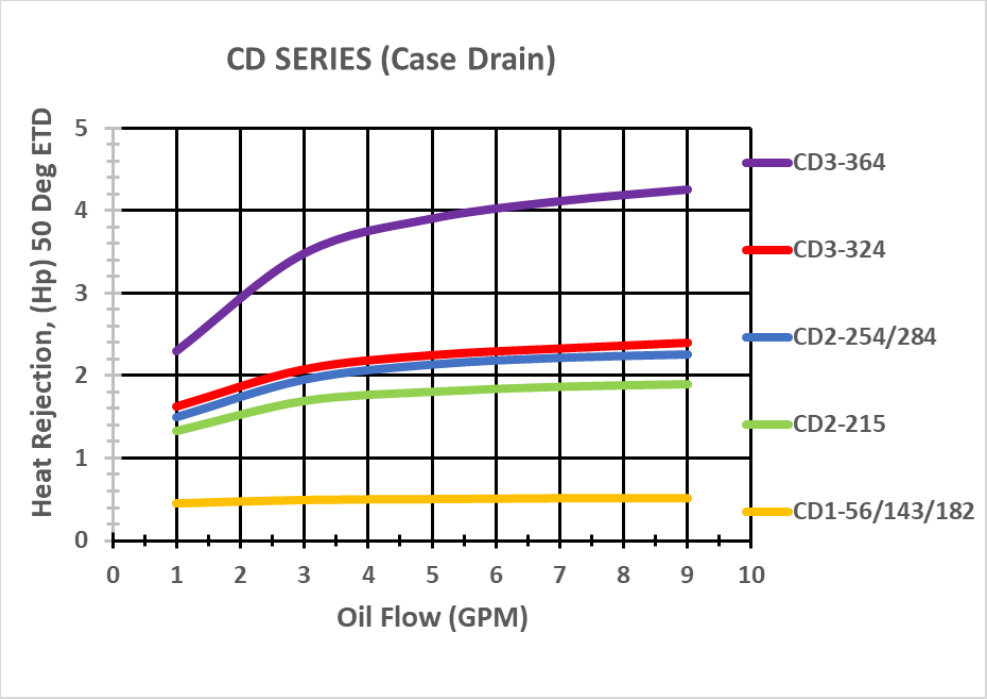
Typical applications are

- Gear Box
- Hydraulic Presses
- Hydraulic Tools

To select the best air-oil coolers, you'll need as much information about the application as possible, including, but not limited to the following:

- Oil Heat Load in BTU/Hr or HP
- Oil Flow Rate (GPM)
- Maximum Inlet Oil Temperature (°F)
- Maximum Ambient Air Temperature During Operation (°F)

If the required heat dissipation is not known, it can be estimated assuming 20-30 percent of the installed horsepower will be converted into heat load.



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