GHT Radiator Dry Ice Cleaning and the Impacts on Radiator Performance

▶ Dry ice cleaning is marketed as nonabrasive. However, when used on metals such as copper and aluminum, it can damage the cores, impact performance, and increase maintenance costs.

▶ Dry ice has a proven history of fin damage on function-critical radiator components. Fin damage causes airflow restriction, which doesn't seem like a big deal until you understand the basics of air-cooled radiators.

▶ Dry ice blasting can change the profile of the fins it is coming in contact with, changing it from the OEM smooth profile to a textured/rough profile. This textured profile can now trap more debris and contamination against it, leading to a fouled radiator and restricted airflow. The best comparison example is when you apply an adhesive or paint to a surface with the recommendation that you scuff or rough up the surface to help the product stick. The same thing happens to the rough fin profiles when oils and dirt move past it. In extreme cases, the fin may become so damaged that the heat-conductive surface area is reduced, significantly reducing heat dissipation.

AIR-COOLED RADIATOR BASICS

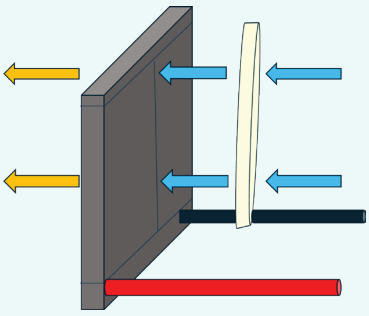
Horizontal radiators (laydown or pancake) are traditionally **blower fans**, and cube radiators are traditionally **sucker fans**. Ambient air is pushed or pulled with a fan through a radiator to lower glycols, oils, and air operating temperatures.

Blower fans are designed to push air through a radiator.

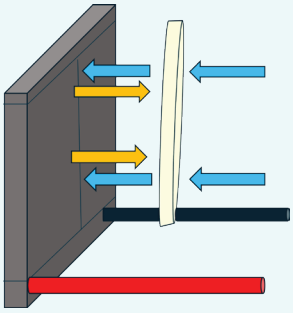
When fin damage occurs, the forced air cannot get through the radiator and redirects the air back toward the fan, which meets more air attempting to go through the fins, creating extreme vibration and fan blade distortion. We call this fan turbulence, and it is the #1 cause of fan failures.

Sucker fans are designed to pull air through the radiator.

When fin damage occurs, the fan cannot pull the designed amount of airflow through the radiator, causing airflow to be restricted, which leads to the engine overheating. A radiator that overheats is a radiator that will have premature component replacements due to increased material fatigue. While this doesn't lead to as many fan failures, it does lead to radiator cores and coolers needing replacement before their expected life span.



Normal Fan Operations



Fin-Damaged Fan Operations

GHT Radiator Dry Ice Cleaning and the Impacts on Radiator Performance

Dry Ice Damage Visuals

What's at Risk?

- Fan failure due to fouled radiators is highly costly and can shut down your pump for extended periods.
- Pictured below is a well-known brand cube needing four new coolers and a new fan. The service provider could have prevented this $40,000 repair job with proper servicing to ensure optimal airflow through the radiator.

DRY ICE SUMMARY

- Dry ice cleaning should only be considered if the radiator cannot be removed from the field for a professional service.
- This fast field repair will remove some surface debris and temporarily enhance the radiator's performance, but it will also cause incremental damage to the radiator cores and a reduction in performance.
- Identifying potential failures during radiator service is the best way to prevent asset damage.
- We recommend cleaning, flushing, and servicing your radiators annually to ensure optimum performance.