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Contaminants in Used Refrigerant

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Kevin Schatz

At Reclamation Technologies, Inc. we do not recommend returning used refrigerant to air conditioning or refrigeration systems following repairs for several reasons. Several things in used refrigerant can cause problems in refrigeration and air conditioning systems. These contaminants include, but are not limited to particles, excess oil, air, acid, other refrigerants, and water.

I have heard from several customers over the years that they have seen particles or crud in used refrigerant. Their first reaction is that the particles came from the recovery cylinder. Although this is a possibility, rust and other particles can also come from the refrigeration system being repaired. Any time air is allowed to enter a refrigerant circuit, oxidation of the metals can and does occur. Steel in receiver and accumulator tanks is one likely place where rust forms. These very fine rust particles, almost a dust, are heavier than the refrigerant and settle out on the bottom of the receiver tank. This is also a common location for a liquid access port where technicians will connect hoses to recover the refrigerant. As the liquid refrigerant is recovered, the rust particles flow through the hose and into the recovery cylinder. The rust will settle on the bottom of the recovery cylinder and show up in a sight glass when the technician begins to charge the refrigerant back into the system following repairs. Most refrigerant recovery unit manufacturers recommend a screen or filter on the inlet of their machines. This is mainly to protect the compressor from rust and other particles. We suggest that you always filter refrigerant as it is charged back into a refrigeration system for this same reason.

Another common contaminant in used refrigerant is water. Most refrigerants are very hydroscopic, they actually attract water! The simple act of passing refrigerant through a hose during the recovery process will often add enough water to cause problems in a refrigeration system. Water will freeze at restriction points such as a capillary tube or expansion valve in a refrigeration system. Water will also freeze in the ends of hoses and at the valves of recovery cylinders. I have heard many times that the valves on our recovery cylinders are faulty, only to find upon inspection that valves are fine. Since our recovery cylinders are pulled to such a low vacuum level, liquid refrigerant will "flash" into a vapor the instant it reaches the cylinder valve. As the refrigerant flashes into a vapor it achieves its boiling point which is well below the freezing point of water. The water in the refrigerant instantly forms an ice plug in the end of the hose or at the recovery cylinder valve. The problem isn't the cylinders valves, it’s the water in the used refrigerant!

Used refrigerant contaminated with air will increase the high side pressures in the refrigeration system. This can lead to excess heat, excess wear on the compressor, and inability of the refrigerant to condense into a liquid in the condensing coil. As discussed earlier, air will also contain water and can add to oxidation and corrosion problems within the refrigeration system.

Due to all of the problems caused by contaminated used refrigerant, we do not recommend returning used refrigerant to a refrigeration or air conditioning system following repairs. It is always safer to charge this system with new or reclaimed refrigerant which exceeds the AHRI 700 standard. As an EPA certified refrigerant reclaimer, Reclamation Technologies, Inc. is specifically equipped and able to handle problems of used refrigerant contaminated with rust particles, air, oil, acid, and water. You have repaired the mechanical system in the air conditioning or refrigeration system. Now, you need to give that system the best chance to function properly for the years to come by removing the variable of contaminated refrigerant. Let the EPA certified reclaimers handle the contaminated used refrigerant and be confident you have left your customer with a quality repair.