

Frigtools

Go Green



Ask Us How ?

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Frigitools



**WINNER OF ENERGY CONSERVATION AWARD AT
ACREX INDIA 2011**



Go Greenask Us How ?

There are millions of ways of going Green..... But as we are associated with Refrigeration & Airconditioning industry we must feel specifically responsible to protect Mother Earth .

We should adopt good refrigeration practices.. i.e., using proper tools , evacuating & dehydrating the systems properly, charging refrigerant accurately, recovering refrigerants, recycling & reusing refrigerants.

Hydrofluorocarbons (HFCs) and other refrigerants with a zero *ozone depletion factor* (ODP) have been subject to a restriction on venting because they are “greenhouse gases,” meaning that they contribute to global warming and must be recovered. (CFCs and HCFCs must also be recovered, both because they have a non-zero ODP and because they are greenhouse gases.)

Primary Practices

Evacuation & Dehydration

A vacuum pump is used to remove both air and moisture from a system. Moisture in the unit can be in either a vapor or a liquid state. When the moisture is in a vapor state, it is easier to remove. When the moisture is in a liquid state, it is much harder to remove, because it must be vaporized. A double stage high vacuum pump should be used to completely evacuate & dehydrate the system before charging with refrigerant.

The deep vacuum method involves reducing pressure in the system to about 200 to 400 microns. When the vacuum reaches the desired level, the vacuum pump is valved off, and the system is allowed to stand for a time period to see if the pressure rises. If the pressure rises and stops at some point, a material such as water is boiling in the system. If this occurs, continue evacuating. If the pressure continues to rise up to ambient pressure, a leak exists, and the atmosphere is leaking into the system. In this case, the system should be pressurized and leak-checked again.

Higher-than-normal levels of non-condensables lead to reduced condenser area, increased compressor inlet enthalpy (increased compressor temperatures and pressures), and reduced cooling capacity. Increased non-condensables also lead to increased compressor pressure ratios, compressor overheating, and compressor motor burnout. Refrigerant moisture content can also be a problem. Visual moisture indicators should be replaced if they are washed out, because moisture can result in expansion valve freezing, increased acid formation, and reduced hermetic compressor life.

Charging Refrigerant Accurately

In fact, the major emission of HFCs is due to the lack of proper measuring & charging equipments with the refrigeration & air conditioning servicing workshops, factories & departments. In majority of cases the refrigerants are charged in systems by crude methods i.e. charging refrigerants directly through the storage cylinders without any measurements. In this way most of the time excess refrigerants are first charged & then excess quantity is being purged into the atmosphere. Actually, the manufacturer of cooling machines do recommend a specific charge e.g a medium size refrigerator needs app. 200 gms of refrigerator whereas a small mechanic buys a minimum of 1 kg refrigerant for charging a refrigerator directly from the storage cylinder & emits the balance refrigerant to atmosphere because of excessive charging & prior flushing the system. Although big manufacturers of cooling machines insists their dealers to buy refrigerant charging equipments for their service workshops, but still a very large number of workshops , mechanics & govt. departments needs refrigerant charging & measuring equipments.



FRIGTOOLS manufactures a wide range of refrigerant measuring & charging equipments from small manual models to semi & fully automatic production line equipments. We would like to emphasize that by using these measuring equipments, the emission of refrigerants can be minimized.

WHY PROPER CHARGING AND COMPRESSOR PROTECTION IS SO IMPORTANT

Reports show that a system undercharged by 10 % will drop efficiency 20 %. A system undercharged by 23% will result in a 52 % efficiency decline. And an overcharge of 5% will cause compressor flooding (compressor dying slow death) and an overcharge of 23% will prove highly destructive to the compressor's life.

The evacuating and charging equipments should be used by A/C plants & workshop owners etc.

USE OF RECOVERY & RE CYCLING EQUIPEMNTS

Refrigerant Recovery

Refrigerant recovery is any process which removes and recovers refrigerants from a system for reuse, recycling, reclamation or proper disposal.

Till, today, in cases of breakdown all the refrigerant is being discharged to the atmosphere. But now this can be avoided. The HFCs should definitely be recovered from these systems. The use of recovery units which are equipped with special driers, oil separators & all controls for pulling the refrigerants safely through the systems free from oil & moisture. And further the recovered refrigerants should be re cycled to pass through high efficiency driers & oil separators to thoroughly clean the refrigerant to the factory standards. For the recovery & recycling Frigtools has quality indigenous equipments to match the world standards. Small investments in these equipments will save the user huge amount of costly refrigerants. The recovered refrigerant should be recycled and reused in existing system.

Other Practices

Refrigerant Conservation

Replacing major HVAC/R components and refrigerant can be very expensive. Thus, preventive maintenance is a key element in the modern refrigeration technician job description. Allowing a compressor motor to burn out and contaminate refrigerant, or failing to repair refrigerant leaks, causes significant environmental problems and severe cost impact to an owner. Conservation includes preserving the purity of existing refrigerants. Reuse of refrigerant results in significant financial benefits as well.

Methods to Minimize the Release of Refrigerants

The ability to maintain and service equipment depends on the service personnel's knowledge, and the technique of recovering and recycling or reclaiming refrigerant from the equipment.

Conservation and containment begin with many already established common-sense methods of saving refrigerant through proper service techniques. These techniques include familiar procedures, such as good brazing and flaring practices, and the use of appropriate evacuation and leak-detection equipment. Traditional service practices must be applied carefully, and some new practices must be learned, but responsible technicians are already minimizing waste.



Keeping the refrigerant in the refrigeration or air conditioning system is a major part of minimizing the escape of refrigerants, but eventually a system must be opened for service. When a system is opened for service, the processes of recovery, recycling, and reclamation become important.

The following are some tips for conserving refrigerant:

- Discontinue past wasteful uses of refrigerant.
- Do not use refrigerant in place of compressed air for cleaning operations.
- Use charging and servicing hoses that do not leak refrigerant.
- Minimize loss of refrigerant when purging air from charging hoses. (Low-loss hose fittings or hand valves should be used.
- Properly maintain centrifugal compressors and purge systems.
- Periodically test the refrigerant for purity. In large systems, the cost of replacing major components and the cost of replacing the refrigerant itself can be very expensive. Conservation includes preserving the quality of existing refrigerants and results in significant financial benefits.
- Include adequate shutoff valves to provide for service with a minimum chance of refrigerant loss. Sections of the system between shutoff valves must be adequately protected against over-pressure.

Keeping Systems Tight

- To ensure against leaks, take extra care to vacuum-check new systems and pull a deep vacuum before charging.
- Take the time to make quality brazed joints, and where flared fittings are required, make them properly.
- Use quality valves to minimize leakage.
- Properly mount compressors and piping to prevent vibration, which can cause refrigerant to leak at piping joints.
- On large open-type compressors, pay close attention to shaft seals, seal lubrication, and shaft alignment.
- Watch shell-and-tube condensers and evaporators for signs of corrosion.
- Closely follow manufacturers' recommendations for compressor maintenance.
- Find and repair leaks (legally required on large systems).
- Keep accurate logs of refrigerant use in large systems, and follow up to find leaks.
- Periodically inspect systems. Even a simple visual inspection can be productive. In hermetic systems, look carefully for traces of oil that could indicate a refrigerant leak.
- Purchase good-quality leak-detecting equipment and know how to use it. Several methods of detecting leaks are available, each with a specific application.

Brazing Techniques

Properly brazing the tubing joints is perhaps the most important detail in assuring a tight, leak-free refrigeration or air conditioning system. These skills can only be learned by proper first-hand training and experience. The following is intended as a checklist of important points for the technician to remember in properly preparing and brazing system fittings during installation and service.

- Measure tubing lengths accurately.
- Do not deform tubing when cutting.
- Make cuts square across the end of the tubing, and properly ream and deburr the ends.
- Properly clean tubing ends and fitting sockets, and keep them clean and free of oils from the skin, dirt, and grit that can ruin the joint.
- Select the proper flux and apply properly.
- After assembling the joint, preheat the tube, and then the tube and fitting.
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- As the filler metal begins to melt, apply heat at the base of the fitting socket to help draw the filler metal in by capillary action.
- Melt the filler metal with the heat of the joint, not the flame.
- Keep the flame moving.
- Bleed nitrogen through the tubing and fitting to help prevent internal oxidation.
- Do not allow pressure to build up in the tubing during brazing.

Brazing Safety

- Always use a pressure regulator on the nitrogen cylinder.
- Wear proper eye and skin protection.
- Avoid breathing vapors from fluxes and filler metals.
- Avoid prolonged skin contact with fluxes.

Preventive Maintenance

In large systems, the cost of replacing major components and the cost of replacing the refrigerant itself can be extremely expensive. Preventive maintenance is a key element in the modern refrigeration technician job description. Allowing a compressor motor to burn out and contaminate refrigerant, or failing to repair system leaks will cause significant cost impact to the owner because of the high cost of refrigerant. Furthermore, the cost of reclaimed CFC and HCFC refrigerants will continue to escalate. Refrigeration technicians who help their customers by early identification of potential problems are the technicians who will be profitable and well respected in the industry.

A good maintenance program means checking the system for leaks each time a service call on the equipment is made, keeping detailed and accurate refrigerant records.

Allowing a compressor motor to burn out and contaminate refrigerant, or failing to repair refrigerant leaks, causes significant environmental problems.

Also the inefficient appliances and cooling systems require relatively high energy input requiring power plants, in turn, to burn fossil fuels to produce more energy. Fossil fuel combustion produces carbon dioxide gas (CO_2), a major component of global warming.

Leak detection

It is very important to detect and rectify leakage points prior to charging any cooling system. The systems should be thoroughly checked with soap solution under nitrogen charge within recommended pressures. Even after charging with refrigerant the minor leaks should be detected with the help of electronic leak detectors or economical halide torch. So, a very large quantity of HFCs going to the atmosphere could be avoided.

Training

Before working on the refrigeration & airconditioning systems the technicians should be trained with simulators/ trainers.

MINIMIZING FLUOROCARBON EMISSIONS

Operational practices for manufacturing, laboratories and plant air conditioning Systems



- All process storage and plant air conditioning lines should be designed and installed to prevent both gradual and sudden refrigerant emissions.
- Braze and weld process and storage lines where possible
- Install plant air-conditioning lines and systems to prevent damage to piping and easy access for maintenance, repair, and recovery of refrigerants
- Protect or conceal piping where practicable
- Use a process to detect and measure refrigerant loss during manufacturing.
- Valves, seals, pumps, tanks, piping, etc should be designed to specifically prevent refrigerant emissions.

Preventive maintenance

- Should be used to ensure responsible practices and effectiveness of refrigerant handling equipment.
- Routine maintenance practices which include emptying lines and use of recovery and/or disposal lines to prevent emissions
- Remove air or inert gases from systems before filling with refrigerant
- Practices and equipment should be designed to minimize refrigerant loss during equipment charging/startup.
- Pressurize equipment and verify that pressure is held upon delivery
- Laboratory practices should limit emissions.
- Recover/recycle/dispose laboratory refrigerant samples as appropriate
- Ensure personnel are trained in safe handling and use of refrigerants
- Refrigeration/air-conditioning test models should be assembled and used with minimal/no emissions.
- Assemble test models using a nitrogen purge for copper refrigerant piping to prevent refrigerant circulation/plugging
- check for test model leakage prior to refrigerant charging

Waste Handling

- Waste handling is the recovery, collection, and disposal of wastes (solid, liquid or gas) containing fluorocarbons.
- Waste refrigerants should be recovered and recycled if possible.
- Waste-containing refrigerants (including refrigerant oils) should be disposed of in an approved manner.

Storage

- This applies to the storage of refrigerants in either bulk tanks or cylinders .
- All refrigerants must be stored in pressure vessels which comply with applicable Govt. laws .

Equipment Shipment & Transportation

- This applies to the relocation of finished equipment from manufacturing facilities to installation or warehouse sites.
- Equipment charged with refrigerant should have initial and arrival pressures noted to determine any leakage. Any reported leakage should be followed-up with an internal quality assurance process, including corrective action if required.



- The equipment data plate should be clearly marked as a fully charged system. Include: weight of system charge, refrigerant type, date of manufacture
- Equipment not charged with refrigerant should be shipped with inert gas to ensure system integrity, with initial and arrival pressures noted to determine any leakage.
- Packaging should be designed to minimize refrigerant loss during shipping.

FRIGTOOLS offers you a wide range of Refrigeration Tools, High Vacuum Pumps, Refrigerant Charging Equipments, Refrigerant Recovery Units, Refrigerant recycling Units, Educational Trainers etc. etc. The use of these equipments will certainly help You in protecting GLOBAL WARMING..

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