Transportation, Handling and Storage of Refrigerants
Overview

- Definitions
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- Handling of New and Used Refrigerants
- Storage of new and used HCFC Refrigerants
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Definitions

• **Disposal** refers to the destruction of used refrigerants, this may be necessary if refrigerants become badly contaminated with other products and no longer are of the acceptable specification for reuse.

• **Reclaimed** refers to the reprocessing of used HCFC to new product specification.
**Definitions**

- **Recovery** refers to the removal of HCFC refrigerant from equipment and collection in an appropriate external container. Recovery does not involve processing or analytical testing.

- **Surplus** refers to quantity in excess of the baseline or target quantities in a given calendar year.
Definitions

- **Recycling** refers to the reduction of used refrigerant contamination using devices that reduce oil, water, acidity and particulates. Recycling is usually conducted in the field with no analytical testing to verify the quality of the recycled refrigerants.

- **Reuse** refers to the use of refrigerant that has been recovered and reclaimed or recycled in the system from which it was recovered or any other system.
Physical and Chemical Properties of HCFCs

- Non-flammable
- Volatile
- Slightly to moderately soluble in water
- Colourless liquids (HCFC-22 is a gas)
- Has a faint odour of ether
- HCFC vapour is heavier than air and can cause suffocation by reducing the oxygen available for breathing
- Prolonged exposure to the skin can result in defatting of the skin and cause dermatitis.
The low solubility in water would indicate that HCFC has a low potential for bioaccumulation and low risks to aquatic environment.
Handling of New and Used Refrigerants

All refrigerants should be handled in accordance with good industrial hygiene and safety practices.

Wear personal protective equipment to protect against contact with skin, eye and clothing.

Do not breathe vapour or spray mist and avoid all contact with skin, eye and clothing.

When handling HCFC refrigerants do not eat, drink or smoke.
Handling of New and Used Refrigerants

In case of a spill, evacuate the area immediately, and procure the required breathing apparatus before returning to the area.

Do not puncture cylinders or drums and follow all precaution for handling and use of compress gas cylinder.

When used indoors provide sufficient air exchange or use local exhaust in work room.

Ensure adequate earthing because liquid refrigerants transferred between containers and from system can result in static charge generation which can lead to an explosion.
Cylinders containing HCFC refrigerants should be stored upright in original containers or other approved containers.

They should be stored at or below a temperature of 50 °C. If stored at or below 50 °C, they should never be more that 80% filled. If the cylinders are exposed to temperature above 50°C, they should not be more than 60% filled.

Never apply steam or direct flame to the cylinder.
Storage of New and Used HCFC Refrigerants

- All HCFC refrigerants vapour are heavier than air, therefore, they should be stored above ground level in well ventilated area.

- If stored inside, the area should be dry and properly ventilated, refrigerant leak detector should be installed to monitor indoor air quality.
Storage of New and Used HCFC Refrigerants

- Cylinders should be protected from salt and other corrosive chemicals.

- HCFC refrigerants react violently with alkali or alkali earth metals such as sodium, potassium, barium in the free state. The reaction might be explosive if the metals are in the fine-grained or powered state. Therefore, they should be stored in separate areas.
Recovered refrigerants should only be stored in approved recovery cylinders painted gray with the top shoulder portion painted yellow.

Recovery cylinders should be properly labeled.
Storage of New and Used HCFC Refrigerants

- Storage cylinders should be inspected periodically for damage or deterioration of condition during storage. During inspection examine the valve assembly for leakage, damage or tampering. Inspection should be carried out at least once every six months.
### Storage of New and Used HCFC Refrigerants

- Most of the cylinders used for HCFC refrigerants are steel cylinders and are under pressure, therefore, they should be handled carefully and all guidelines for handling compress gas cylinders observed.

- Never drop cylinders whether empty or full or hit with a hammer or other sharp or blunt object.
Vehicles used for transporting cylinders should be open, the use of cars, vans, or any other enclosed vehicle is extremely dangerous, and should be avoided. If this cannot be achieved the vehicle should be properly ventilated.
Transportation of New and Used HCFC Refrigerants

- A 2kg fire extinguisher is required on all vehicles carrying gas cylinders to fight engine and cab fires.
Transportation of New and Used HCFC Refrigerants

- All compressed gas cylinders should be secured from movement during transportation and should not project beyond the sides or ends of the vehicle. Cylinders that can move may open accidentally, or roll off the vehicle into the path of oncoming traffic.
Transportation of New and Used HCFC Refrigerants

- Always install the protective cap on the cylinders when they are being transported. If the cylinders were not designed to accept a protective cap over the valve, special care must be taken to prevent the valve from damage or opening during transportation.
Transportation of New and Used HCFC Refrigerants

- When moving cylinders within the work site, they must be firmly strapped onto an appropriate wheeled device. Never roll a cylinder on its base or lay it down to roll on its side.
Transportation of New and Used HCFC Refrigerants

- A forklift truck should be used to move large containers of refrigerant on pallets.

- Never strap or lift cylinder by the valve or valve cover.
End