UNEP

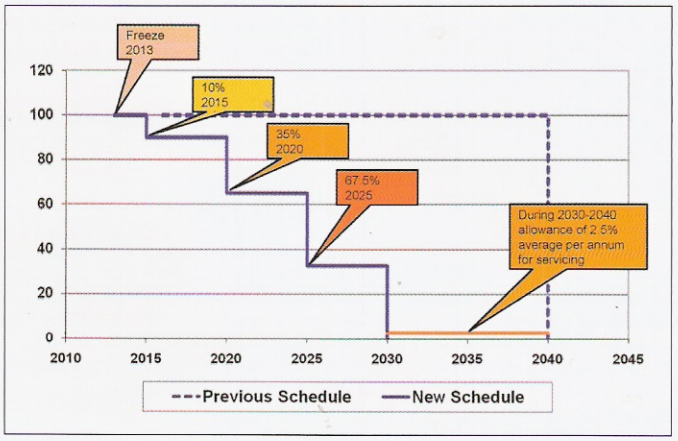
# FACT SHEET No. 25
# Applications of Hydrochlorofluorocarbons (HCFCs) and blends containing HCFCs

UNEP Compliance Assistance Programme

1 **The purpose of this fact sheet is to present a snap shot of some of the predominant uses of HCFCs and their blends. It is essential for the National Ozone Units to know them especially when Articles 5 countries are now gearing up to formulate their HCFC phase-out management plans (HPMP) and detailed survey for HCFC-consuming sectors is undertaken in the countries.**

This fact sheet is prepared following Decision XIX/6 to accelerate phase-out of HCFCs from production and consumption. HCFCs, with their low ODP, were used as interim substitutes for CFCs in some applications and were not intended to be a permanent solution.

2 The new schedule of targets of phase-out of HCFCs to be achieved by Article 5 Parties is as follows:




3 HCFCs not only deplete ozone layer but also contribute to global warming. This accelerated phase-out of HCFCs will therefore provide dual benefits for the ozone layer and climate system. The Ozone Depleting Potential (OPD) and the Global Warming Potential (GWP) of HCFCs that are significantly used in today's markets are given below in Table 1.

## Table 1 ODP and GWP values of commonly used HCFCs

| HCFC | International Union of Pure and Applied Chemistry (IUPAC) name | ODP | GWP |
|---|---|---|---|
| HCFC-22 (R-22) | Chlorodifluoromethane ($CHClF_2$) | 0.055 | 1810 |
| HCFC-123 (R-123) | 2,2-Dichloro-1,1,1-trifluoroethane ($CHCl_2CF_3$) | 0.02 | 77 |
| HCFC-124 (R-124) | 2-Chloro-1,1,1,2-tetrafluoroethane ($CHClF\text{-}CF_3$) | 0.02 | 609 |
| HCFC-141b (R-141b) | 1,1-Dichloro-1-fluoroethane ($CCl_2FCH_3$) | 0.11 | 630 |
| HCFC-142b (R-142b) | 1-Chloro-1,1-difluoroethane ($CClF_2CH_3$) | 0.065 | 2270 |
| HCFC-225ca (R-225ca) | Dichloropentafluoropropane ($CF_3CF_2CHCl_2$) | 0.025 | 120 |
| HCFC-225cb (R-225cb) | Dichloropentafluoropropane ($CF_2ClCF_2CHClF$ ) | 0.033 | 586 |

4 HCFCs and blends containing HCFCs are used as foam blowing agents, refrigerants, solvents, sterilants and fire suppressants. The predominant HCFCs are HCFC-22 and HCFC-123, HCFC-141b and HCFC-142b. More details on the properties of HCFCs and blends containing HCFCs are available on UNEP's HCFC Help Centre website: http://www.unep.fr/ozonaction/topics/hcfc.asp

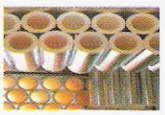
The main products and applications of HCFCs and blends containing HCFCs used in foam, refrigeration and air conditioning, fire fighting and solvent applications are as follows:

# Foam

- Rigid polyurethane foam (Sandwich panels, spray foam, Boards & Blocks, Pipe insulation, supports etc.)
- Integral skin polyurethane foam (automotive components such as steering wheels, head rests, and furniture components as chair arm rests)
- Microcellular foams (shoe soles and some engineering components)
- Extruded polystyrene foams or XPS foams (panels / boards for building insulation)

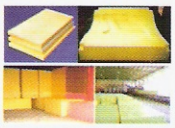
## Rigid polyurethane foams

Sandwich panels



Pipe insulation

Spray foam



Boards & Blocks

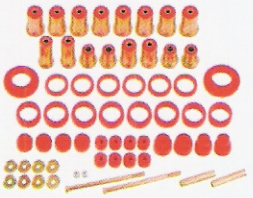
Pipe support

## Integral skin polyurethane foams

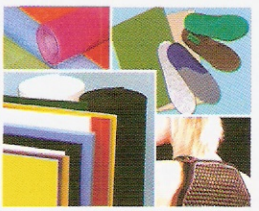
Automotive components

Furniture components

## Microcellular foams



Engineering components



Shoe soles

## Extruded polystyrene or XPS foams

Boards for building insulation

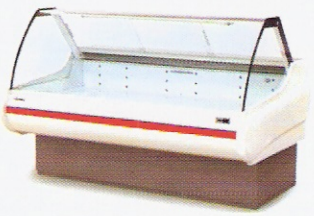
# Domestic and commercial refrigeration

- House – hold refrigerators and freezers
- Chest coolers / freezers, display cabinets, supermarket and vending equipment

## Domestic appliance

House–hold refrigerators and freezers (in insulation foam)

## Commercial appliance



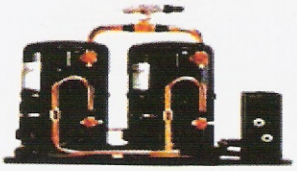
Display cabinet

Chest Cooler

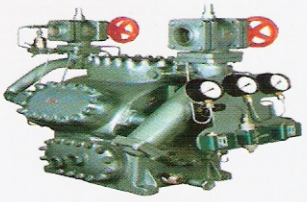
Vending Machine

Visi-cooler

## Industrial refrigeration

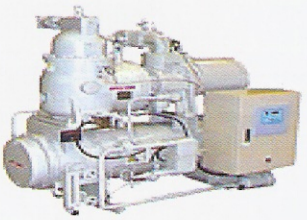


Hermetic compressors

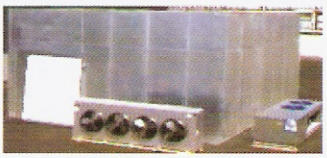


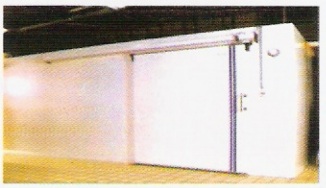
Open compressors

Air handling units



Industry process chilling





Cold storages

## Transport refrigeration

Refrigerated trucks and trailers

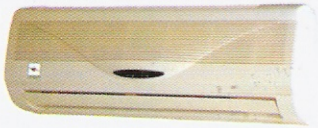
Reefer containers

Process chilling

# Air conditioning

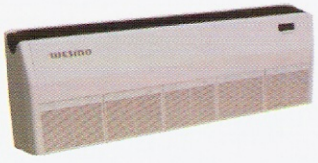
- Residential air conditioning (Window & split air conditioners for house hold use)
- Commercial air conditioning (Packed & Split air conditioners for medium sized commercial establishments such as retail shops and offices)
- Industrial air conditioning / chillers (Reciprocating, screw and centrifugal chillers for central air conditioning)
- Transport air conditioning (Air conditioning systems for buses / coaches, railway coaches, truck cabs etc.)

## Residential air conditioning



Wall mounted split air conditioners

Window Air conditioners



Ceiling Floor Air Conditioners

Air conditioning compressors

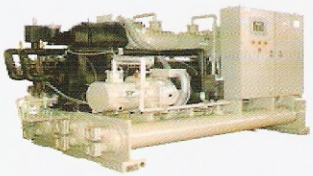
## Commercial air conditioning

Heat pump

Unitary air conditioners

Packaged Air conditioning units for medium sized commercial establishments such as shops and offices

## Industrial air conditioning

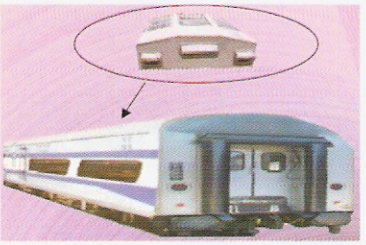


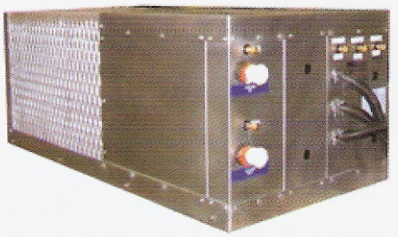
Screw chillers

Reciprocating chillers

Central air conditioning chillers

## Transport air conditioning





Air conditioning systems for buses / coaches, railway coaches, truck cabs etc

## Firefighting

- Portable fire-extinguishers
- Central fire-extinguishing systems


## Solvents

- Table top cleaners (for jewelry, small items in small quantities)
- Low emission batch cleaners
- Precision cleaning for electronic items
- Cleaning & lubrication in manufacturing implantable medical devices (such as syringes, intravenous needles etc.)



Precision cleaners

Batch cleaners

**Acknowledgement**

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