

OZONACTION UNIVERSITY COURSE FOR FUTURE ENGINEERS



United Nations Environment Programme (UNEP) OzonAction Branch, as well as other United Nations (UN) agencies operating under the Montreal Protocol on Substances that Deplete the Ozone Layer, offered over the last two decades exhaustive training programmes for the servicing technicians on the refrigeration good practices including emissions reduction and sound management of refrigerants. These training programmes always offered also opportunity to field engineers to get involved but majority of the training recipients were field technicians. Therefore, the level of training programmes is always simplified to the minimum scientific level with more focus on hands-on practices and service techniques.

Therefore this course is an effort to support the engineering education process at different engineering institutes and colleges by acquainting the Future Engineers with the knowledge and skills required to manage refrigerants soundly as well as understand the technical and policy aspects associated with the refrigeration and air-conditioning industry as a result of global environmental considerations in particular the protection of the ozone layer and the combat of the climate change.

This special course is first of its kind that offer comprehensive scientific information and knowledge suitable for the academic levels. It offers thorough scientific background as well as applied knowledge that would help building the capacity of future engineers about management of refrigerants.

Engineering institutes and colleges are encouraged to benefit of this effort and use it in accordance to their internal academic structures. The course is developed to ensure complying with international academic standards for similar engineering education. Users of the course are also encouraged to keep abreast with the development at the global level in relation to environment and technology. They are also advised to wisely use the course, or any part of it, in accordance to the local capacities and needs.

UNIVERSITY COURSE AND SUPPORT MATERIAL

UNIVERSITY COURSE PACKAGE

- 1 University Course - Full package
- 2 University Course - Modules 1-5
- 3 University Course - Lecture Notes
- 4 University Course - Activities Sheets

ALTERNATIVES FACT SHEETS - AVAILIABLE FROM THE OZONE SECRETARIAT WEBSITE

- FS 1 Index and fluid naming conventions for refrigerants

- FS 2 Overview of HFC Market Sectors
- FS 3 Domestic Refrigeration
- FS 4 Commercial Refrigeration
- FS 5 Industrial Refrigeration
- FS 6 Transport Refrigeration
- FS 7 Small Self Contained Air-Conditioning
- FS 8 Small Split Air-Conditioning
- FS 9 Large Air-Conditioning (air-to-air)
- FS 10 Water Chillers for Air-Conditioning
- FS 11 Heat Pumps (heating only)
- FS 12 Mobile Air-Conditioning
- FS 13 Insulating Foam
- FS 14 Aerosols
- FS 15 Glossary of Terms and Technical Definitions

GOOD SERVICING PRACTICES - PHASING OUT HCFCs IN RAC



Refrigerant Emission - Animation

1. Environmental and Human Health Impacts of ODS - Refrigerants
2. Alternatives to HCFCs and their Characteristics
3. Handling of HCFCs/HFCs Refrigerants
4. Servicing of HCFCs/HFC Based Air-Conditioners
5. Tools and Equipment for Servicing
6. Do's and Don'ts in RAC Servicing
7. Handling and Safety Issues for HC Refrigerants
8. Servicing of HC Based Air-Conditioners
9. Installation Procedure of Air Conditioner Window and Split
10. Refrigerant Recovery Recycling and Cylinders
11. Economics of Refrigerant Reclamation and Best Service Practices
12. Contaminated Refrigerant and Refrigerant Identifier
13. Selection and Safe Usage of Cleaning Solvents
14. Evacuation and Charging Unit - Maintenance
15. Recovery Machine - Maintenance
16. Single Stage Versus Double Stage Nitrogen Pressure Regulator and Maintenance

OZONATION FACT SHEETS

- FS 1 - How the Montreal Protocol Protects Health
- FS 2 - Safe Use of HCFC Alternatives in RAC: Flammable Refrigerants
- FS 3 - Safe Use of HCFC Alternatives in RAC: Higher Pressure Refrigerants
- FS 4 - Safe Use of HCFC Alternatives in RAC: Higher Toxicity Refrigerants

PUBLICATIONS

1. International Standards in Refrigeration and Air-Conditioning
2. National Certification Schemes for Refrigeration and Air-Conditioning Service Technicians
3. Safe Use of HCFC Alternatives in Refrigeration and Air-Conditioning
4. The Montreal Protocol and Human Health

VIDEO



Cooling without Warming the Planet

Cooling Without Warming video documentary produced by UNEP OzonAction ROLAC and the Colombian NOU (English, aprox. 30 mn) unveils successful alternative cooling experiences with natural refrigerants for domestic and industrial applications in 5 Latin American and Caribbean countries.

View video on
YouTube: [English](#) | [Spanish](#) | [Portuguese...](#)

Article Publish Date:
March 10, 2017