**Workshop on Air-Conditioning Good Practice Training for Low GWP-refrigerants**

**9-11 December 2018**

**Yantai Vocational College**

**Yantai, China**

**Sunday, 9 December – Day 1 | Theoretical Part**

| **Time** | **Title** | **Description** | **Who** |
| --- | --- | --- | --- |
| *08:30* | *Registration and arrivals* | *Participants to please arrive by 08:30 to begin at 09:00*  | *（签到8:30-9:00）* |
| 09:00 | Welcome remarks and group photograph | Centro Studi Galileo - Italy ;Yantai Vocational College*（CSG、烟台职院等出席致辞并合影）* |
| 09:20 | Participants introduction  | One-minute introduction from each participant | 所有学员（*每一位与会者一分钟自我介绍）* |
| 09:20 | Session 1: Montreal Protocol and RAC Sector  | **Presentation: Environmental Impacts in RAC** * Ozone Layer and environmental impacts of the ozone layer depletion
* Greenhouse gases and climate change
* Kigali Amendment and implications for RAC Servicing Sector
* European countries' actions and experiences in RAC Servicing Sector
 | *RAC对环境的影响**臭氧层与臭氧层耗竭的环境影响**温室气体与气候变化**基加利修正案及对RAC服务业的启示**欧洲国家在制冷维修方面的行动与经验* |
| *10:30* | *Coffee break （茶歇）* |
| 10:45 | Session 2: Review of the safety aspects  | **Presentation: Design and components for R290 to address safety issue*** + Safety components
	+ Lokring vs Brazing
	+ Others
 | *R290解决安全问题的设计和部件**安全组件**洛克环封口与铜焊**其他* |
| *12:00* | *Lunch break（ 午休）* |  |
| 13:00 | **Presentation: Safe Handling of Flammable Refrigerants*** Common rules for storage and transport of refrigerants
* Handling of refrigerants and safety issues
 | *制冷剂的安全处理**制冷剂贮存和运输的一般规则**制冷剂的处理和安全问题* |
| 13:45 | Session 3: Good practice in installation and servicing of R-290 RAC | **Presentation: Pressure and Leak Test, Evacuation, Charing and Recovery** * Pressure and leak test
* System evacuation
* Charging of flammable refrigerant
* Recover of HCFC、HFC refrigerant using recovery machine
 | *压力和泄漏测试、填充和回收**压力和泄漏测试**-抽真空**R290制冷剂的充注**用回收机回收HCFC、HFC制冷剂* |
| 14:30 | **Presentation: Good installation procedures of R290 room air-conditioner** * Type of installation
* Installation procedures and steps
* Special requirements for flammable refrigerants
 | *R290房间空调器良好安装程序**-安装类型**安装程序和步骤**-可燃制冷剂的特殊要求* |
| *15:00* | *Coffee break* |  |
| 15:30 | **Presentation: Good Servicing Procedures of R290 room air-conditioner:*** Servicing procedures and steps
* Special requirements
 | *R290房间空调器的良好维修程序**-服务程序和步骤**-特殊要求* |
| 16:45 |  | **Plenary Discussion on First Day Training** | *小结* |
| 17:00 | *End* |
| **Monday 10 December – Day 2 | Practical Part**  |
| 09:00 | Session 4: Refrigerant Piping System for R-290 Room Air-conditioner | **Demonstration by trainer*** Tube cutting, flaring, swaging and bending
* Brazing
* Lokring
 | *教练员示范**管材的切割、扩口、锻造和弯曲**钎焊焊接**-洛克环封口* |
| 09:45 | **Practical Session** * Tube cutting, flaring, swaging and bending
* Brazing
* Lokring
 | *学员练习管材的切割、扩口、锻造和弯曲**钎焊焊接**-洛克环封口* |
| 11:15 | **Demonstration by trainer - options and limitation of different leak test method*** Use of nitrogen during brazing
* Use of nitrogen to perform high pressure test
* Use of electronic leak detector for halogen refrigerant and HC
* Soapy water test/bubble leak test
 | *讲师示范-不同泄漏测试方法的操作与局限性**-在钎焊使用氮气**-使用氮对进行高压测试**-使用电子卤素制冷剂检测泄漏的方法和HC**肥皂水试验/气泡泄漏试验* |
| *12:00* | *Lunch Break（ 午休）* |  |
| 13:00 | Session 5: Evacuation, Charing, Recovery and Discharge | **Demonstration by Trainer*** System evacuation
* Charging of flammable refrigerant
* Recovery of HCFC、HFC refrigerant using recovery machine
* Flammable refrigerants discharge
 | *教练员示范**-抽真空**可燃制冷剂的填充**用回收机回收HCFC、HFC制冷剂**可燃制冷剂排放* |
| 14:00 | **Practical Session** **Group A:** * Flammable refrigerant discharge
* System evacuation
* Charging of flammable refrigerant

**Group B:*** Recovery of HCFC、HFC refrigerant using recovery machine
 | *学员练习A组：**可燃制冷剂排放**-抽真空**可燃制冷剂的填充**B组：**用回收机回收HCFC、HFC制冷剂* |
| *15:00* | *Coffee break（茶歇）* |  |
| 15:30 | **Group A:** * Recovery of HCFC、HFC refrigerant using recovery machine

**Group B:*** Flammable refrigerant discharge
* System evacuation
* Charging of flammable refrigerant
 | *学员练习A组：用回收机回收HCFC、HFC制冷剂**B组：可燃制冷剂排放**-抽真空**可燃制冷剂的填充* |
| *17:00* | *End* |  |  |
| **Tuesday 11 December – Day 3 | Practical Part**  |
| 09:00 | Session 6: Good practice  | **Demonstration by Trainer: Good practice and installation of R290 AC*** Installation of AC unit
* Pressure test
* Evacuation
* Charging of the system
* Leak test (electronic leak detector)
* Start of operation
* Discharge
 | *培训师示范：R290 AC的良好安装**交流单元的安装**-压力测试**-抽真空**-填充**泄漏测试（电子验漏仪）**-启动操作**-排放* |
| *10:30* | *Coffee break（茶歇）* |  |
| 11:00 | **Practical session: Good practice and installation of R290 AC*** Installation of AC unit
* Pressure test
* Evacuation
* Charging of the system
 | *实践环节：R290AC的良好操作与安装**分体空调的安装**-压力测试**-抽真空**-充注* |
| *12:00* | *Lunch break（ 午休）* |  |
| 13:00 | **Practical session: Good practice and installation of R290 AC*** Leak test (electronic leak detector)
* Start of operation
* Discharge
* Fault finding and repairing on R290 AC
 | *实践环节：R290AC的良好操作与安装**泄漏试验（电子检漏仪）**-启动操作**-排放**R290 AC故障查找与修复* |
| *15:30* | *Coffee break（茶歇）* |  |
| 16:00 | Closing session  | * Examination
* Certification of participants
* Closing remarks
 | *考试**颁发证书**闭幕词* |
| *17:00* | *End* |  |  |