**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* |  |  |