

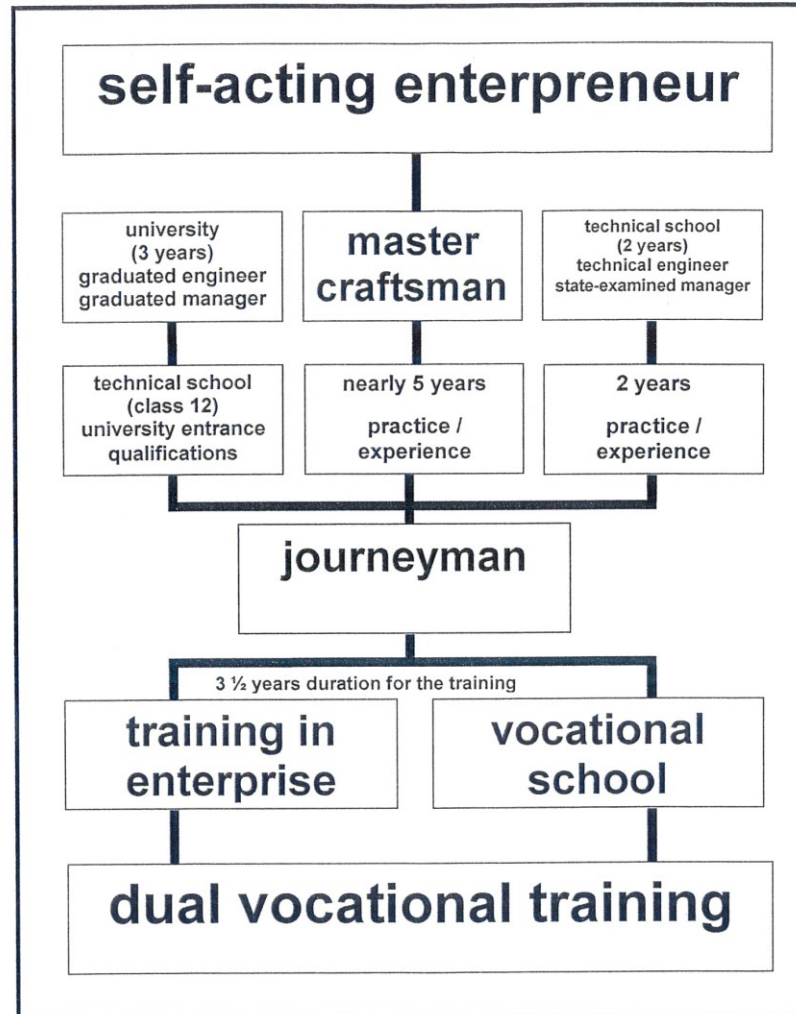
Informationszentrum für
Kälte-, Klima- und Energietechnik gGmbH

Low-emission refrigeration and air conditioning in Central and South America

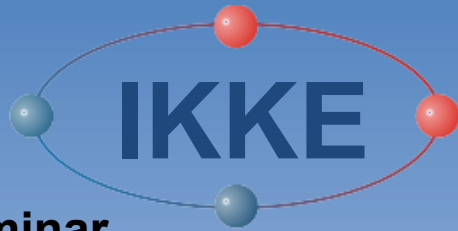
- Capacity Building

- **Dual vocational education in Germany**
- **Seminar for natural fluids**
- **REAL Alternatives – blended e-learning**

Dipl.-Ing. Karsten Beermann



The Refrigeration Trade in Germany
Dipl.-Ing. Karsten Beermann

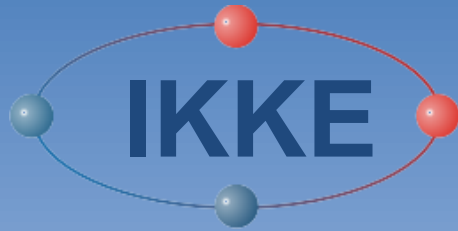


Seminar

– Design and practice with propane - refrigeration

Content:

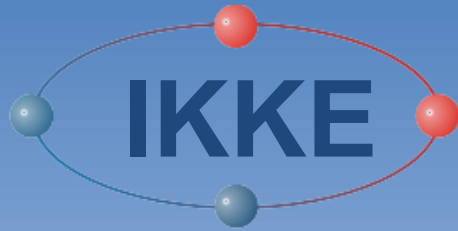
- basics, thermodynamic behaviour
- REAL Alternatives 4 Life
- energetic behaviour and comparison
- hydronic design and comparison with EnEV § 12
- Measurement and analyzing of results
- Example for design with propane in hermetic systems
- Components available
- Safety equipment
- Requirement on personnel
- to avoid accidents
- filling, maintenance and recycling



REAL Alternatives – modules

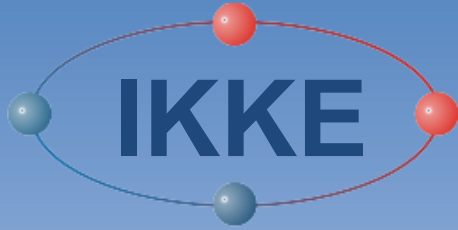
1. Introduction to Alternative Refrigerants – safety, efficiency, reliability and good practice
2. Safety and Risk Management
3. System design using alternative refrigerants
4. Containment and leak detection of alternative refrigerants
5. Maintenance and repair of alternative refrigerant systems
6. Retrofitting with low GWP-refrigerants
7. Checklist of legal obligations when working with altern. refig.
8. Measuring the financial and environmental impact of leakage
9. Tools and guidance for conducting site surveys

www.realalternatives.eu



European Standard

- EN 13313
“competence of personnel”
→ definition of competences
(e.g. for propane, ammonia, CO₂)
→ ISO 22712 (worldwide!)



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Thank you for attention !

