

TRAINER MANUAL  
Practical Exercise Module A\_PE\_2\_Bend refrigeration grade copper tube

Level 0

<b>Objectives:</b>	<p>Participants gain skills in:</p> <ol style="list-style-type: none"> <li>1. Bend refrigeration copper tube</li> <li>2. Observation and application of measures for occupational health and safety and accident prevention regulations.</li> <li>3. Observation and application of environmental protection and rational use of material resources and energy.</li> <li>4. Planning and controlling structured work processes, controlling and evaluating work results.             <ol style="list-style-type: none"> <li>4.1 Preparing workstation with consideration of the work task</li> <li>4.2 Planning and defining work steps and procedures</li> <li>4.3 Read and interpret written technical information related to the work task</li> <li>4.4 Work based on technical drawings and required dimensional accuracy</li> <li>4.5 Select and use appropriate equipment &amp; tools</li> <li>4.6 Demonstrate knowledge and skills for refrigeration copper tube bending (1/4"; 3/8"; 1/2")</li> <li>4.7 Deburring, cleaning and preparation of the work samples</li> <li>4.8 Cleaning of installation site</li> <li>4.9 Handing over of work samples</li> </ol> </li> <li>5. Maintenance and servicing of tools             <ol style="list-style-type: none"> <li>5.1 Cleaning, maintaining and preserving tools</li> </ol> </li> </ol>
<b>Duration:</b>	90 minutes
<b>Material:</b>	<p>Whiteboard/Blackboard or handout of practical exercise description</p> <ol style="list-style-type: none"> <li>a. A_PE2_HO_Work description</li> <li>b. A_HO_Last minute risk assessment</li> <li>c. A_HO_Bending exercise</li> <li>d. A_HO_Table of copper tubes</li> </ol>
<b>Tools &amp; equipment:</b>	<ol style="list-style-type: none"> <li>e. 8 x Copper tubes (annealed)             <ul style="list-style-type: none"> <li>- 650 mm 1/4"</li> <li>- 650 mm 3/8"</li> <li>- 650 mm 1/2"</li> </ul> </li> <li>f. 8 x Bending tools</li> <li>g. 8 x Wheel type tube cutters</li> <li>h. 8 x Deburrer</li> <li>i. 8 x Steel measuring tapes</li> <li>j. 8 x Marker pens (permanent)</li> </ol>
<b>Workshop arrangements</b>	<p>Workshop is arranged for up to sixteen (16) participants. Provision of eight (8) work benches, eight (8) complete sets of tools.</p> <p>Sufficient workshop space</p>

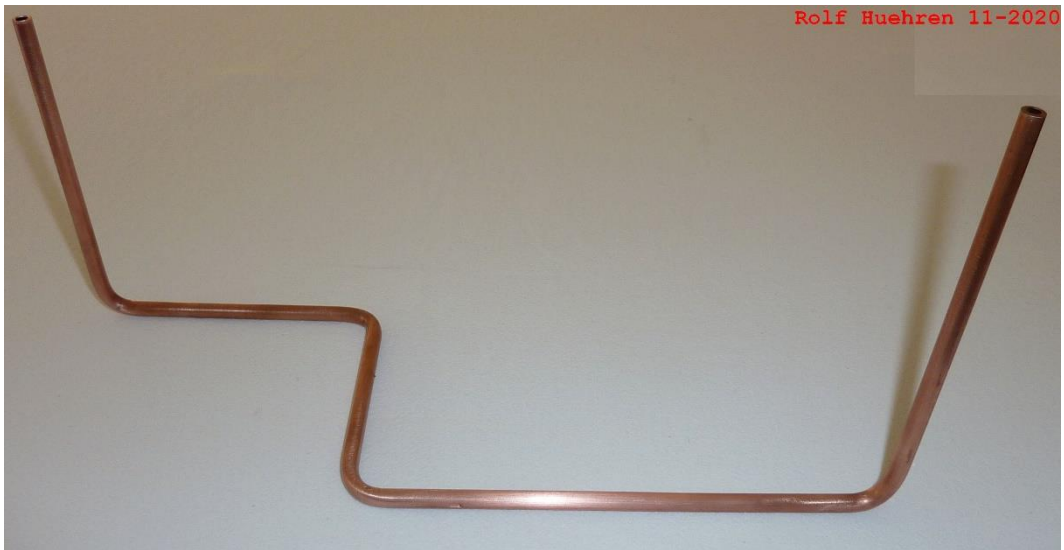


Figure 1: Bent refrigeration copper tube work sample

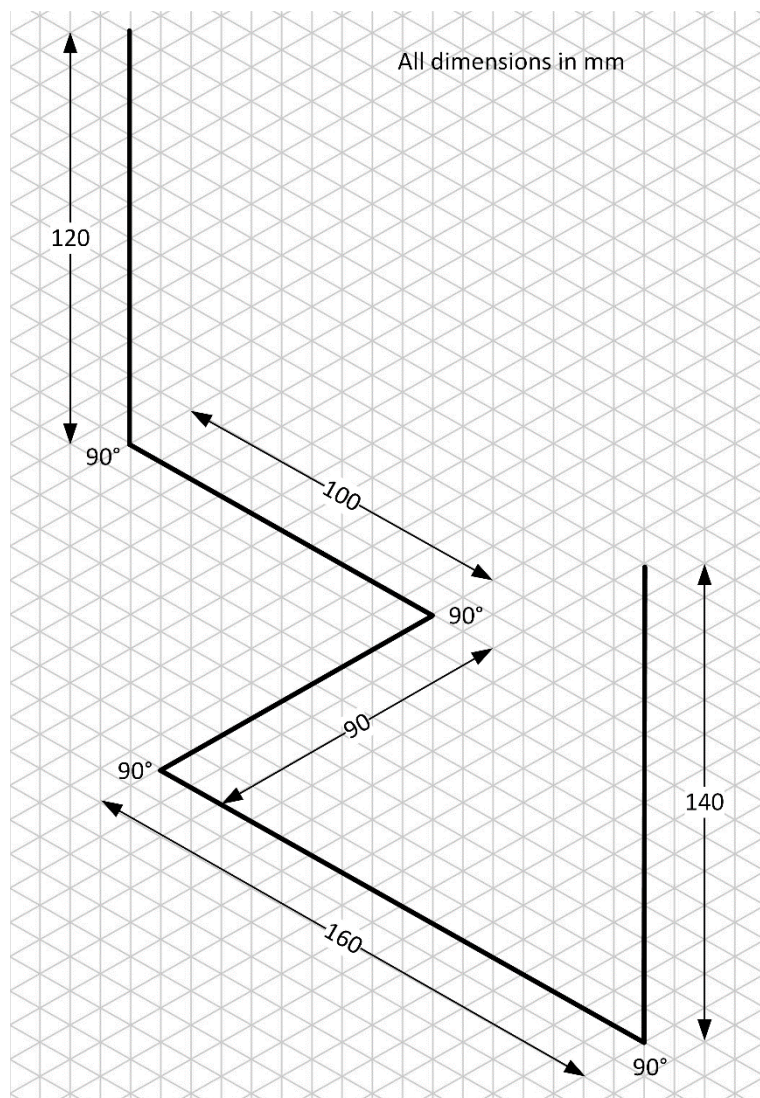


Figure 2: Isometric drawing copper tube work sample

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Summary – Session Overview				
TIME	CONTENT	OBJECTIVES	TRAINING MATERIAL	DESCRIPTION OF TRAINING SESSION AND TRAINER NOTES
15'	1. Participants briefing 2. General safety briefing	<b>Participants:</b> <ul style="list-style-type: none"> <li>Understand the given work-task</li> <li>Understand the requirements for the use of standardised copper tubes for RAC application</li> <li>Are familiar with the required safety arrangements</li> <li>Are familiar with the local conditions</li> </ul>	<ul style="list-style-type: none"> <li>A_PE2_HO_Work description</li> <li>A_HO_Last minute risk assessment</li> <li>A_HO_Bending exercise</li> <li>A_HO_Table of copper tubes</li> </ul>	<b>Plenary</b> <ul style="list-style-type: none"> <li>Trainer explains work task</li> <li>Trainees obtain permit of work</li> </ul> <u>Team work is not permitted</u>
75'	<b>Bend refrigeration copper tube as per work description</b> <ul style="list-style-type: none"> <li>Obtain permit of work, execute risk assessment</li> <li>Undertake worksite preparation, tools, equipment and PPE check (having risk assessment in mind)</li> <li>Safeguard the workshop area and inform involved parties</li> <li>Prepare practical exercise according to technical drawing</li> <li>Carry out each bending task in turn, start with ¼" and end up with ½"</li> </ul>	<b>Participants:</b> <ul style="list-style-type: none"> <li>Obtain knowledge of how to execute a risk assessment at the workplace</li> <li>Learn how to get familiar with using PPE</li> <li>Obtain knowledge and skills of how to use and prepare tools for execution of the work task</li> <li>Learn to cut-out a specified length of annealed copper tube from a coil</li> </ul>	Tools and equipment as specified above	Trainer observes work routine and gives instructions to participants if they have questions. Trainer evaluates work according to outlined criteria with the help of an assessment sheet. <ul style="list-style-type: none"> <li>All authorisation was obtained</li> <li>Each trainee executes the work task independently</li> <li>Work area is safeguarded</li> <li>Appropriate PPE is selected in line with the job requirements</li> <li>Workplace arrangements are structured and in clean conditions.</li> <li>All necessary tools are in safe conditions and well arranged</li> <li>Work instructions technical plans/drawings are interpreted as per job requirements</li> </ul>

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TIME	CONTENT	OBJECTIVES	TRAINING MATERIAL	DESCRIPTION OF TRAINING SESSION AND TRAINER NOTES
	<ul style="list-style-type: none"> <li>Cleaning, maintaining and preserving tools, practical exercise and work-place</li> <li>Hand over the practical exercise to the trainer</li> </ul>	<ul style="list-style-type: none"> <li>Obtain knowledge of how to straighten the obtained copper tube</li> <li>Learn how to mark copper tube so that it is bent in the correct place</li> <li>Learn how to bend copper tube to the correct angle</li> <li>Learn to use and apply the documentation of using tools and equipment</li> <li>Understand the legislations and standards applicable in the region of operation</li> </ul>		<ul style="list-style-type: none"> <li>Work requirements are verified in line with site conditions and the provided components</li> <li>Copper tubes are prepared consistent with the dimensional drawing and applicable standards</li> <li>Copper tubes are bent correctly, clean and without surface damages in a neat and tidy fashion</li> <li>Workplace arrangements are structured and in clean conditions.</li> <li>Rational use of material resources was maintained.</li> </ul> <p><u>Competency must be assessed through:</u></p> <ul style="list-style-type: none"> <li>Direct observation</li> <li>Demonstration</li> <li>Questions related to required knowledge</li> <li>Competency may be assessed in the work place</li> </ul> <p><u>Assessment requires evidence in form of:</u></p> <ul style="list-style-type: none"> <li>Conducted the relevant risk assessment</li> <li>Ensured continuous OHS measures</li> <li>Bent the copper tube according to the provided documentation.</li> <li>Ensured continuously organised and clean workplace condition</li> </ul>
<b>90 min</b>	Total time			