

Trainer Instructions: Compressors and Compressed Air Systems

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Title	COMPRESSORS AND COMPRESSED AIR SYSTEMS
Objective	To obtain an understanding of compressors and compressed air systems, including the types of compressors, how to assess their performance and the main areas for energy conservation.
Minimum duration and approach	<ul style="list-style-type: none"> ▪ 1.5 session (2 hours), including the quiz and workshop exercise. ▪ Recommended approach: spend up to 1 hour and 20 minutes on the PowerPoint presentation. Explain the quiz and workshop exercise and resume 30 minutes in the second session and spend about 30 minutes to go through the answers. ▪ Presentation: 35 slides ▪ Textbook chapter: 24 pages
Contents	<ul style="list-style-type: none"> ▪ Introduction ▪ Types of compressors ▪ Assessment of compressors ▪ Energy efficiency opportunities
Assessment of participants	<ul style="list-style-type: none"> ▪ Pose questions during the presentation. ▪ Take the quiz with 10 multiple choice questions. ▪ Carry out the workshop exercise. Participants can be asked the following: <p><i>A Free Air Delivery test and leakage tests were conducted in an automobile industry for a 1000 cfm compressor by operating the compressors with out equipment that use compressed air.</i></p> <p><i>The results of the Free Air Delivery test showed that the compressor delivers 90% output of the rated capacity.</i></p> <p><i>The results of the leakage test were:</i></p> <ul style="list-style-type: none"> - Compressor was on load for 8 minutes - Compressor was unloaded for 48 minutes - Compressor was consuming 144 kW <p><i>Calculate the following:</i></p> <ol style="list-style-type: none"> 1. Free air delivery or the output of the compressor 2. Specific power consumption 3. % leakage in the compressed air system 4. Quantity of compressed air leakage 5. Power lost due to leakage

	<p>If participants have difficulties completing the workshop exercise, or if time is running out, then it may be helpful to give them the formulae that they should use. In this exercise these are:</p> <ul style="list-style-type: none"> - <i>Free air delivery: % of rated capacity X cfm</i> - <i>Specific power consumption: actual output / actual consumption</i> - <i>% leakage in compressed air system: $[T / (T = t)] \times 100$</i> - <i>Quantity of compressed air leakage: % leakage X actual output</i> - <i>Power lost due to leakage: leakage quantity / specific energy</i>
<p>Other comments</p>	<ul style="list-style-type: none"> ▪ Case study options from www.energyefficiencyasia.org or other sources could be included in this session as illustrations of how other companies reduce energy consumption and costs. ▪ Note that the agenda assumes that the quiz for the Refrigeration and Air Conditioning session is combined with the quiz/workshop session for compressors.