

TRAINING PROGRAM

# trainer's guide

## REACTIVE CHEMICALS

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# REACTIVE CHEMICALS

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***This guide will help you develop a training program that will support a safe and productive workplace environment for your employees. It will help you to:***

- Prepare and organize your training session.
- Assemble training materials.
- Present the PowerPoint® slide show.
- Conduct training exercises.
- Stimulate discussion that applies to the topic presented in the presentation and to your organization's work environment.
- Document the training and training feedback for continuous improvement.

### **Training Objectives**

When the training is complete, employees who work with reactive chemicals will be able to:

- Identify reactive chemical hazards.
- Understand the nature of chemical reactions.
- Know how to detect and manage reactivity hazards.
- Respond safely to reactive chemical emergencies.

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### **Rationale for Training**

Chemical reactions can be extremely hazardous if they are not thoroughly understood and controlled. When intentional or unintentional reactions get out of control, they can result in fires, explosions, or releases of toxic fumes or gases. Your employees could be injured—or even killed—as a result of an uncontrolled chemical reaction. Your facility and equipment could be damaged in an explosion or fire. It's essential, therefore, that employees who work with or around reactive chemicals know how to safely manage these hazardous materials to prevent accidents.

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### **Regulatory Overview**

Although OSHA does not have specific regulations regarding reactive chemicals, the safe use of all chemicals in the workplace, including reactives, is regulated by OSHA's Hazard Communication Standard (29 CFR 1910.1200).

The Hazard Communication Standard requires you to:

- Have a written Hazard Communication Program that explains how chemical safety and health information will be communicated to employees;
- Prepare a list of all the hazardous chemicals, including reactives, used or stored in your facility;
- Provide an SDS for each hazardous reactive chemical in the workplace and make sure SDSs are readily available to employees on all shifts; *and*
- Train employees about OSHA's Hazard Communication Standard, reactive

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chemical hazards and precautions, and the safety and health information provided in SDSs and on container labels.

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### Training Requirements

As you do with any other type of hazardous chemical, you must train employees to work safely with reactive chemicals.

Your training program should contain, at a minimum, the following elements:

- What reactive chemicals are
- How they can endanger health and safety
- The potential for hazardous chemical reactions in the workplace
- The company's hazard management program
- Necessary precautions on the job
- Emergency reporting and response

**Trainer Qualifications.** The person conducting the training must be knowledgeable in the subject matter covered by the elements contained in the training program, and as it relates specifically to the workplace that the training will address.

**Audience.** All employees who work with or around reactive chemicals.

**Training Frequency.** Employees should be trained when they are hired or assigned a job that exposes them to reactive chemical hazards. Periodic refresher training is recommended to keep awareness of hazards and precautions sharp and ensure that employees are following required procedures. Retraining for all employees should occur immediately following any incident or near miss involving reactive chemicals.

**Delivery method and format.** Trainers may use hands-on demonstration, classroom, and any other method of training that leads to comprehension and understanding of the topic. There should be an opportunity for interactive questions and answers with the person conducting the training session.

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**Trainee evaluation.** Measures of training effectiveness can be performance-based (observed behavior), or by written or oral test.

**Recordkeeping.** Training records should be kept showing when the training was held, what was covered, who gave the training and the trainer's qualifications, and who attended.

State requirements. Several states have adopted additional training provisions that are stricter than federal HazCom rules (California, Iowa, Michigan, Minnesota, Tennessee and Washington for private- and public-sector workplaces, and Arkansas, Georgia, Massachusetts, New Jersey, New York, Oklahoma, Pennsylvania, and Rhode Island for public-sector workplaces). Check the regulations in these states for the additional requirements.

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### Basic Principles of Adult Learning

Most adults are self-directed learners; they want to learn what they want, when they want, and how they want. Adult learners have their own style of learning that includes four key elements: motivation, reinforcement, retention, and transference. See the **Basic Principles of Adult Learning** guide in this product for more information about the key elements of adult learning and other insights for training adults.

***This section will help you prepare for your presentation and ensure that you have all the materials you will need. You may use different materials that cover the topic if you believe they will be more effective.***

### **Resources and Materials**

The following resources and materials should be available for every training session:

- A quiet room with basic accommodations for the comfort of trainees
- Sign-in sheet (included with this product)
- Printed copies of the training program (PowerPoint slide show notes, slide show handouts, exercises, and employee handouts)
- Copies of relevant regulations or company policies (if applicable)
- Computer and projector with the PowerPoint slide show loaded
- Screen or blank wall for projecting the slide show
- Copies of the evaluation form (optional)
- Copies of the quiz (optional)

Have the following materials available for the reactive chemicals training session:

- Examples of SDSs for reactive chemicals in your workplace
- Chemical compatibility chart for chemicals in the workplace
- Examples of PPE trainees are required to wear when handling reactive chemicals
- Name(s) and phone number(s) of personnel to whom reactive chemical incidents and near misses should be reported

See the **Appendix: Training Program Support Materials** section for a complete list of support materials that come with this product.

### **Prepare the PowerPoint Slide Show**

Before presenting the PowerPoint slide show, read the PowerPoint slides, slide show notes, the handouts, the exercises, and the quiz.

Prepare equipment and other support materials as suggested and appropriate for your workplace.

**Slide show notes.** The following slide show notes describe recommended interactive activities and materials to have on hand as you present the slide show. Each note is also embedded with the slide show notes for each slide to assist you as you are presenting your training program. They are listed here in the sequence that they are presented in the slide show:

- Bring to the meeting examples of SDSs for reactive chemicals in your workplace and explain how to find safety and health information.  
*Materials to have on hand:* Examples of SDSs for reactive chemicals in your workplace.



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- Explain how reactive chemicals in your workplace are most likely to react and become a fire hazard.
- Discuss intentional chemical reactions in your workplace.
- Discuss spontaneously combustible materials used or stored in your workplace.
- Discuss any peroxide-forming materials used or stored in your workplace.
- Discuss any water-reactive materials used or stored in your workplace.
- Discuss any oxidizers used or stored in your workplace.
- Discuss any self-reactive chemicals used or stored in your workplace.
- Discuss potentially incompatible materials in your workplace and identify some potentially hazardous mixing scenarios. Provide trainees with a chemical compatibility chart for chemicals in the workplace.

*Materials to have on hand:* Chemical compatibility chart for chemicals in the workplace.

- At the transition slide, answer any questions and conduct an exercise if appropriate.
- Discuss your company's hazard management program as it relates to reactive chemicals.
- Bring to the meeting examples of PPE that trainees are required to wear when handling different types of reactive chemicals. Explain the purpose and proper use of each piece of PPE.

*Materials to have on hand:* Examples of PPE trainees are required to wear when handling reactive chemicals.

- Discuss hazard detection information found in SDSs for the reactive chemicals trainees work with.
- Discuss your company's incident reporting and investigation procedures, including to whom trainees should report problems.

*Materials to have on hand:* Name(s) and phone number(s) of personnel to whom reactive chemical incidents and near misses should be reported.

- Discuss specific first-aid procedures described in the SDSs of reactive chemicals trainees work with.
- Review your company's emergency response procedures as they apply to incident involving reactive chemicals.
- Tell trainees where they can find emergency equipment in their work areas. Discuss the use of different types of fire extinguishers for fires involving different reactive chemicals. Also demonstrate the correct use of a fire extinguisher, and talk about when to use an extinguisher (to fight small, controlled fires), and when to evacuate and leave firefighting to specially trained personnel or professional firefighters.
- At the transition slide, answer any questions and conduct an exercise if appropriate.
- Give trainees the quiz.

### Customize Slides, Slide Show Notes, and Quiz

The information contained in the PowerPoint slide show covers general guidelines and regulatory requirements for the topic that is presented. You may want to modify the slide show and quiz to meet site-specific objectives and policies

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or local regulatory requirements. If you have the PowerPoint software application on your computer, you may add, modify, or delete slides and slide show notes to meet your needs. See the **How to Customize PowerPoint** guide in this product for more information.

**Customize specific slides and slide show notes.** You may want to modify some slides and/or slide show notes to include information specific to your workplace. In the slide show notes of select slides in this presentation, we have recommended that you consider making such modifications.

Make sure that any modification or deletion of information does not diminish your ability to achieve your training goals or meet regulatory requirements.

The slides cannot be changed in the PDF version (included with this product) of the PowerPoint slide show. If you want to modify the slide show notes to correspond to any changes in the PowerPoint slide show, this can be done in the “notes” view of PowerPoint.

**Customize the quiz.** The quiz can be easily modified; simply type in your changes using Microsoft Word or other standard word processing application. In order to preserve the original document, change the name of the file before saving it.

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### Prepare Materials and Schedule the Training Session

**Computer projection.** If you have a computer video projection system, run a test to make sure the PowerPoint slide show runs properly.

**Overhead projection.** If you plan to use an overhead projector, print the PowerPoint slide show slides out on transparencies. The slides will be clearer if they are printed in color. If you don't have a color printer, your local print or copy store can print out color transparencies for you.

**Slide show handouts.** PowerPoint offers four options for printing slide show handouts: six slides per page, four slides per page, three slides per page, and two slides per page (in the print dialogue). We recommend you print copies of the PowerPoint slide show in three-slides-per-page format if you want trainees to take notes during the slide show. See the **How to Customize PowerPoint** guide in this product for information about printing slide show handouts.

**Employee handouts.** Prepare and copy any handouts, such as the employee handouts provided with this product, or any site-specific handouts you may have.

**Exercises.** Determine which exercises you plan to conduct, and prepare any materials or equipment you need.

**Scheduling.** Schedule the class for a date and time convenient to most trainees. Groups of 15 or fewer people are ideal.



***This section provides tips and suggestions for presenting training materials to trainees.***

### **Present to Trainees**

The time it will take to present the PowerPoint slide show and conduct the exercises will vary depending on the size of your facility, the complexity of issues in your workplace, the level of knowledge and comprehension of the topic by trainees, and the amount of site-specific information. In general, assume each slide will take 2 to 3 minutes to cover. If you practice your presentation, keep in mind that presentations typically take longer during the actual training.

You can use your own words rather than read from the slide show notes.

**Training tip:** Consider varying the format within your training program two or three times during each hour of training. For example, switch from the PowerPoint slide show to an exercise after 20 minutes of slides, then return to the PowerPoint. Most people learn via more than one format (e.g., seeing images, reading text, hearing, and activity); a multimodal presentation keeps trainees interested and energized.

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### **Trainee Participation**

Involve trainees as much as possible by asking them questions and getting them to talk about their own jobs. Encourage them to make suggestions they may have on how to improve conditions in the workplace related to the topic.

Ask trainees to talk about experiences in their workplace related to the topic. Use real-life examples as often as possible to reinforce learning.

### **Handout(s)**

Give each trainee a copy of the handout(s) before the slide show or after the quiz.

### **Exercises**

Multiple exercises for this topic are included with this product for your use during or after the PowerPoint slide show. The exercises may also be used independently of the slide show. Exercises are an excellent mechanism for reinforcing the training.

### Questions and Answers

Answer any questions the best that you can. Even if you don't have the technical knowledge to answer a lot of questions on the topic, you can still answer the important questions about the way that your workplace is addressing the topic-related issues. Follow up with responses to employee questions either personally, through the employee's supervisor, or the facility's intranet, if applicable.

### Follow-Up

Document that the training took place and who attended. Also, provide the trainees with documentation that they have completed training (such as a certificate of completion), and be sure to notify any trainees who failed to satisfactorily complete the training.

### Complete these follow-up tasks:

- Distribute the **Certificate** to successful trainees as proof of completion of training (optional).
- Distribute the **Evaluation Form** to employees and collect the completed forms (optional).
- Place copies of the **Quiz** results in each trainee's personnel file.
- File one copy of the **Attendee Sign-In Sheet** with the workplace records, and file one copy in the trainer's files.
- Fill in the appropriate information on the **Training Record** for each employee.
- Within 2 weeks of giving the training, talk to some of the employees and supervisors to make sure they understood what was presented and how it applies to them.

***Below is a list of support materials included with this product to help you prepare the training program and document your activities.***

***Additional Training Materials***

- **Certificate**—A customizable certificate of completion for attendees. The file allows the user to type in the training topic and the trainee's name.
- **Exercise**—An activity to help trainees apply their knowledge of work practices.
- **Employee Handout**—A single-page summary of key facts the trainee should know about the topic.

***Forms***

- **Attendee Sign-In Sheet**—A record of training program attendees
- **Evaluation Form**—An evaluation by trainees of the performance of the trainer
- **Training Record**—A record of all training sessions for each employee, including the date for refresher training

***Guidance***

- **Basic Principles of Adult Learning**—A guide for training adult learners
- **How to Customize PowerPoint**—A guide with instructions for using the PowerPoint application program and customizing the content of slides and slide show notes