

A close-up photograph of a person wearing a yellow protective suit and a clear respirator mask with a green filter. The person's eyes are visible through the mask's lens, looking intently forward. The background is dark and out of focus.

# **BREATHE EASIER WITH THESE**

## Respiratory Protection Must Haves

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Our Presentation Will Begin Soon



**BREATHE EASIER WITH THESE**  
Respiratory Protection Must Haves

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ICW Risk Management Services



Today's Presenter:

**Glen O'Rourke, ALCM**

# Respiratory Hazards Can Be Deadly

Up to **762,000**

are diagnosed annually with cancer caused by prolonged exposure to **workplace carcinogens.**”

- Centers for Disease Control and Prevention

# Today's Topics

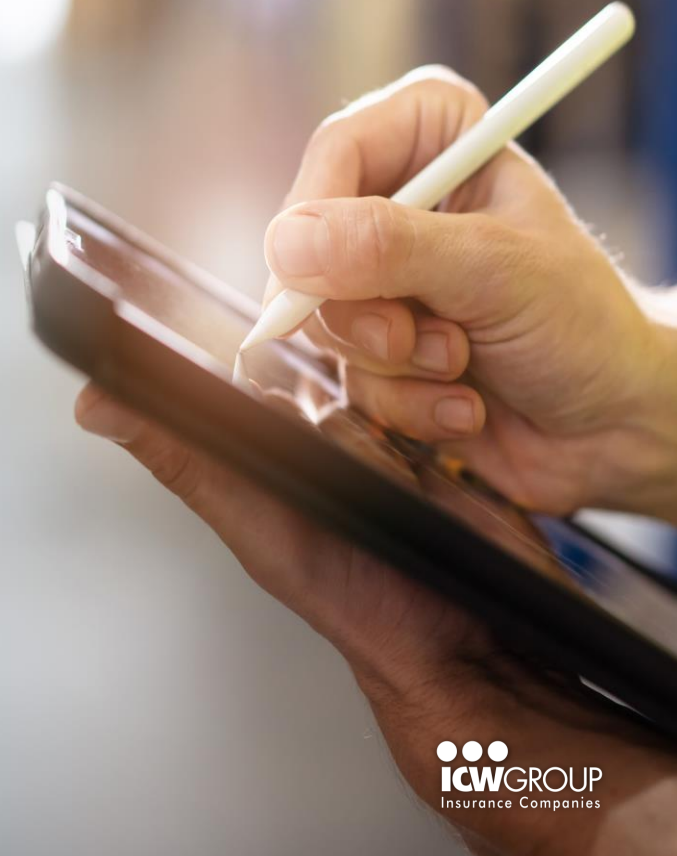
Consequences of noncompliance

Impact of respiratory exposure

Top 5 most common mistakes

Helpful resources

Q&A



# Today's Topics

Consequences of noncompliance

Impact of respiratory exposure

Top 5 most common mistakes

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# The wrong kind of headlines!

**\$56,000** for respirator program deficiencies

**\$62,000** for inadequate respiratory protection


**\$152,000** for inadequate chemical protection

**Daily Record**  
PART OF THE USA TODAY NETWORK

HOME NEWS SPORTS ENTERTAINMENT OPINION ARCHIVE

## OSHA: Lab headquarters in Madison safety violations in Conn. facility

Michael Izzo, @MizzoDR Published 4:46 p.m. ET Sept. 1, 2015



MADISON – A borough with more than \$152,000 in fines protecting its employees, the Occupational Safety and Health Administration announced Thursday.

Employees of Quest Diagnostic laboratory in Shelton, Connecticut filed a complaint last year after growing concerns because they were experiencing headaches, and difficulty breathing, OSHA said.


Quest Diagnostic is headquartered in Madison.

OSHA began an inspection of the Shelton facility on March 10, 2014, after receiving complaints of safety violations of the group's laboratory safety standard, which protect their employees against the effects of hazardous chemicals. Those standards include a complete chemical hygiene plan stating the employer's policies, procedures and responsibilities for protecting employees, OSHA said.

SAFETY AND OSHA NEWS

## Did employer completely ignore workers' safety concerns?

by Fred Hoster | June 29, 2015 | Comments (0)



More than a dozen times over a two-month period, employees made notations in logs about a crane cable that needed to be repaired. But a court said the company "utterly failed to take steps to discover violations." What happened when the company appealed a \$56,000 OSHA fine?

UNITED STATES DEPARTMENT OF LABOR  
OSHA News Release - Region 1  
U.S. Department of Labor

News releases may be out of date or not accurate.

BOS 2014-153

workplace safeguards  
in's Back Bay  
fire, chemical, respiratory hazards  
... doing business as D & J Ironworks, failed to  
fire that cost the lives of two Boston fire  
Occupational Safety and Health Administration

... was caused because the Malden-based  
arc welding equipment during high wind  
90 Beacon St. ignited clipboard on an

... tion and protection program, failed to train its  
... did not move the railing to another location  
... OSHA's area director for Boston and  
... ment these required, common-sense  
... edness, tragic fire."

... ratory and chemical hazards associated with  
... stitute employees' medical fitness to wear  
... in respirators, evaluate respiratory hazards for  
... in welding and how to address them, and

# Today's Topics

Cost of noncompliance

Impact of respiratory exposure

Top 5 most common mistakes

Helpful resources

Q&A





# Definition of a Respirator

An apparatus of personal protective equipment (PPE) used to protect a person from an airborne, and thus respirable, substance that is potentially hazardous, by preventing that person from inhaling that substance in a concentration that would harm the person.

The protection method can be removal (filtering) of the substance, or by supplying air from another source where the substance is not present.

# Respiratory Protection Program

When respirators are used as a control measure to protect employees from exposure to substances in hazardous concentrations, the OSHA Respirator Protection Standard applies.

The Federal OSHA respiratory protection standard is:

29CFR1910.134

# Source of Hazardous Substance

- Production processes (spray finishing/coating, plating, welding/flame cutting, etc.)
- Cleaning/degreasing operations
- Agricultural operations (spraying of chemicals)
- Cutting/grinding/sanding
- Environment

# Grinding



# Hazardous Substances

Federal OSHA Subpart Z

- Permissible Exposure Limit (PEL)
- Acetic Acid: 10ppm; 25 mg/m<sup>3</sup>

ACGIH Threshold Limit Values (TLV)

Safety Data Sheet (SDS)

# Impact to Employees' Health

Overexposure to airborne/respirable

- Acute effects
- Chronic effects
- Indirect effects
- Death

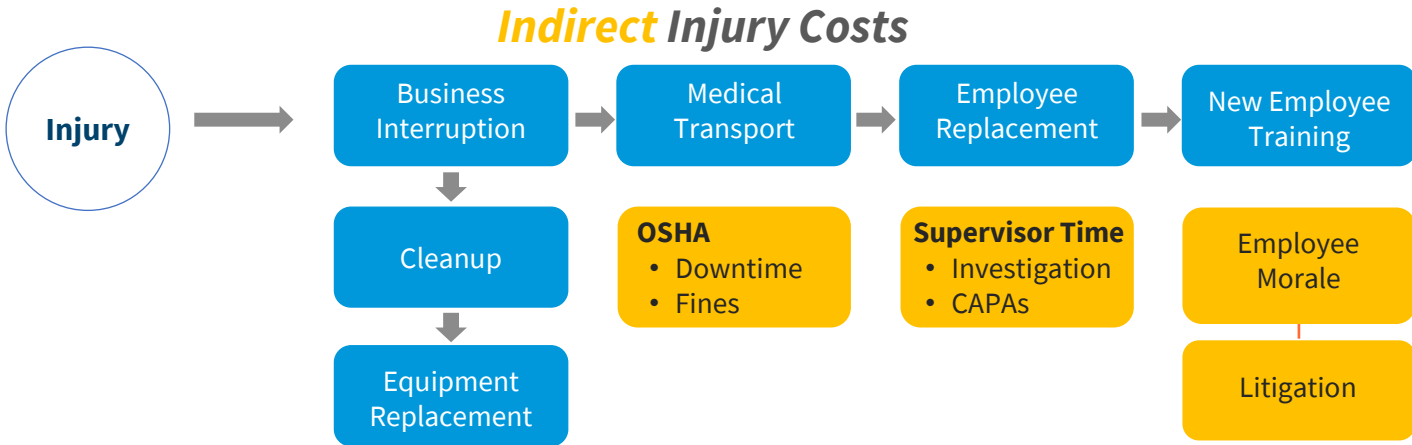
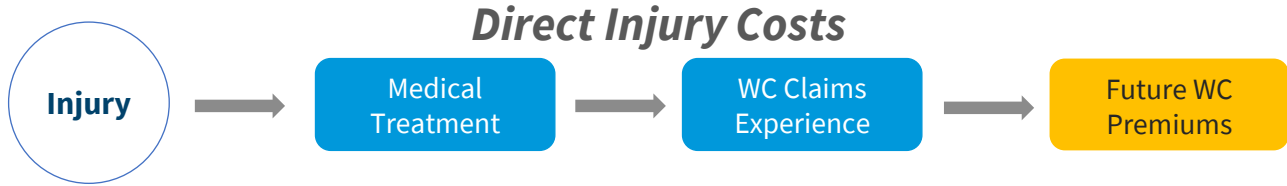


# Impact to Your Organization

- Employee injuries/illness (claims)
- Productivity loss
- Decline in morale
- Company reputation
- OSHA fines



# Impact to Your Organization





# Today's Topics

Cost of noncompliance

Impact of respiratory exposure

**Top 5 most common mistakes**

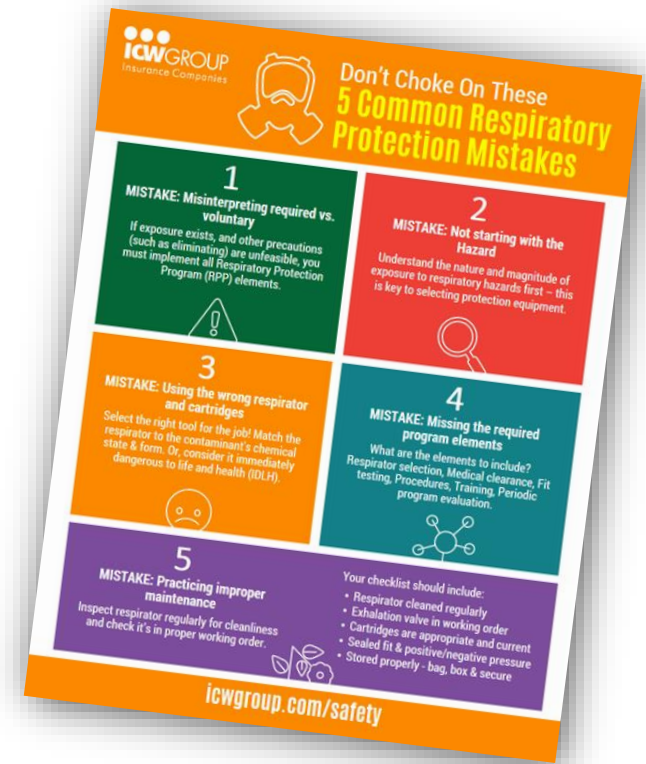
Helpful resources

Q&A



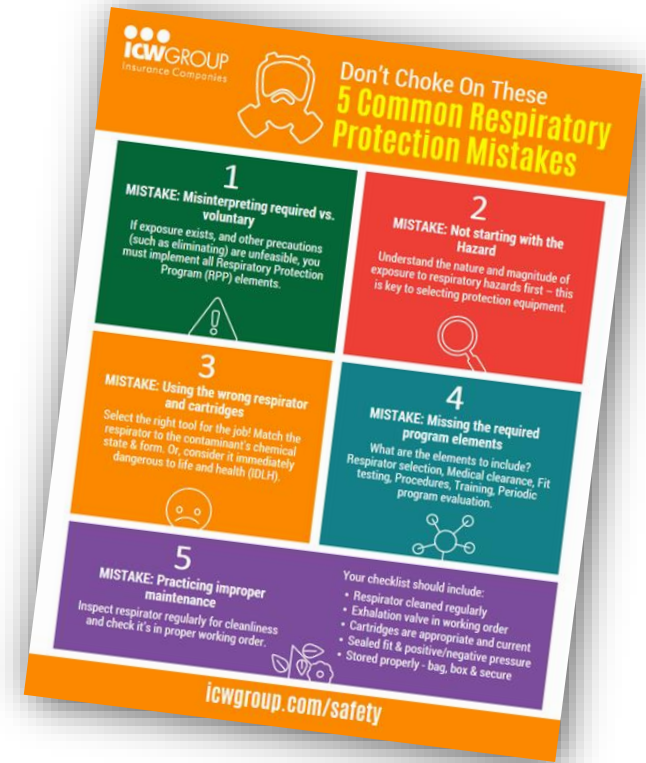
# Top 5 Most Common Mistakes

1. Misinterpreting required vs. voluntary
2. Not starting by understanding hazard
3. Using wrong respirator and cartridges
4. Missing required program elements
5. Practicing improper maintenance



# Top 5 Most Common Mistakes

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# MISTAKE #1

Misinterpreting required vs. voluntary

## REQUIRED

- Exposure risk at or above limit (PEL)
- Control strategies other than respiratory are unfeasible / too costly
- As result:
  - All Respiratory Protection Program (RPP) elements are required to be implemented



# MISTAKE #1

Misinterpreting required vs. voluntary

## VOLUNTARY

- Exposures are below the level requiring control
- Comfort against 'nuisance' particles
- Filter face-piece (dust mask)
  - Using respirator other than dust mask requires elements of RPP
- Provide Appendix D of the OSHA Regulation



# MISTAKE #1

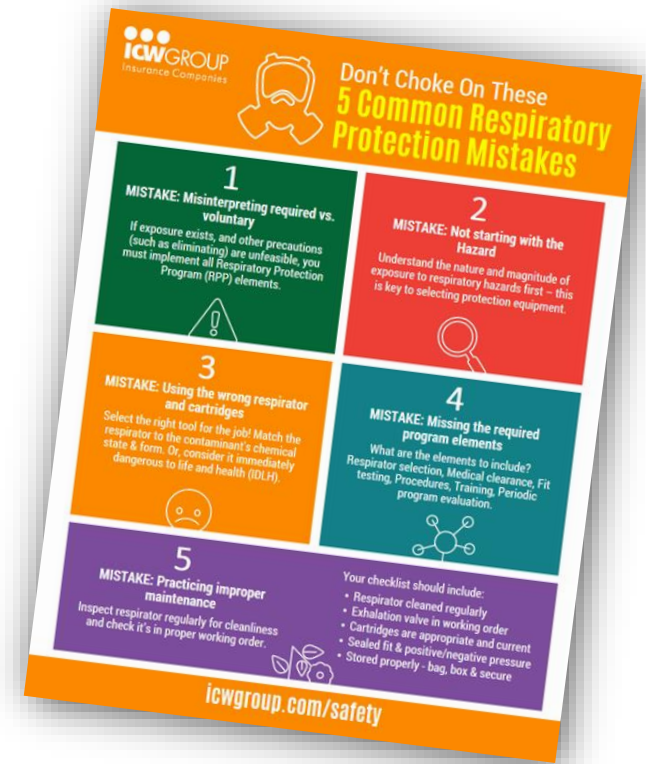
Misinterpreting required vs. voluntary

## **Appendix D of the OSHA Respirator Rule - Key Points**

- Read and heed all manufacturer instructions on use, maintenance, cleaning, care and respirator limitation warnings
- Choose respirators certified to protect against contaminant of concern
- Don't wear respirator into atmospheres containing contaminants for which your respirator is NOT designated to protect

# Top 5 Most Common Mistakes

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## MISTAKE #2

Not starting by understanding hazard

Employers must characterize the nature and magnitude of employee exposures to respiratory hazards...

–**before** selecting respiratory protection equipment.





## MISTAKE #2

Not starting by understanding hazard

Identify hazards with...

- ✓ Job hazard analysis
- ✓ Chemical inventory
- ✓ Periodic inspections



# MISTAKE #2

Not starting by understanding hazard

Review:

- **Identify**
  - Materials, tasks, environment
- **Quantify**
  - Exposure?
- **Control**
  - Solve the solvable!



# MISTAKE #2

Not starting by understanding hazard

## Assess Risks:

Dusts

Fogs

Fumes

Mists

Gases

Smoke

Sprays

Vapors

## MISTAKE #2

Not starting by understanding hazard

### EVALUATE:

- Engineering controls
- Administrative controls
- Isolation/substitution
- Work practices
- PPE (respirators)



# MISTAKE #2

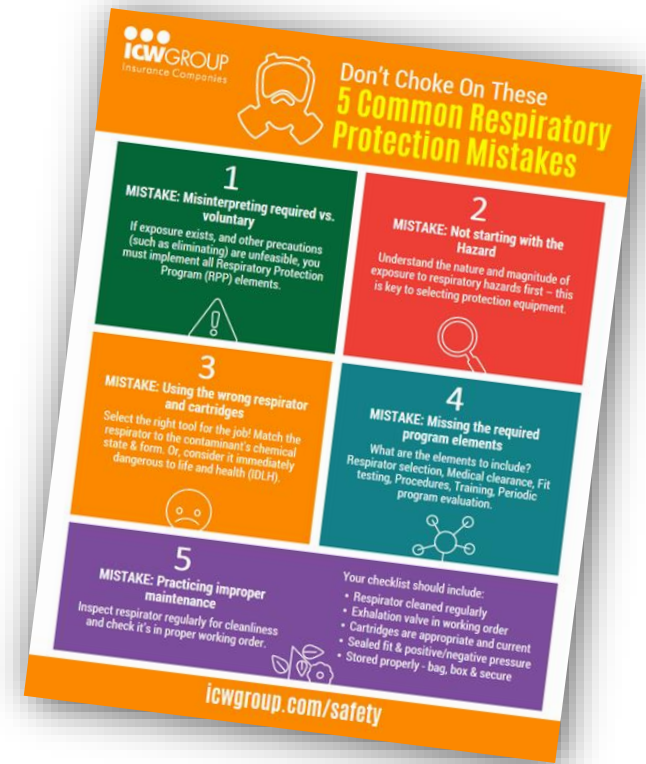
Not starting by understanding hazard

Engineering Control:



# Top 5 Most Common Mistakes

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# MISTAKE #3

Using the wrong respirator and cartridges

Selecting the “right” tool...Depends on the job!



or



or



or



or

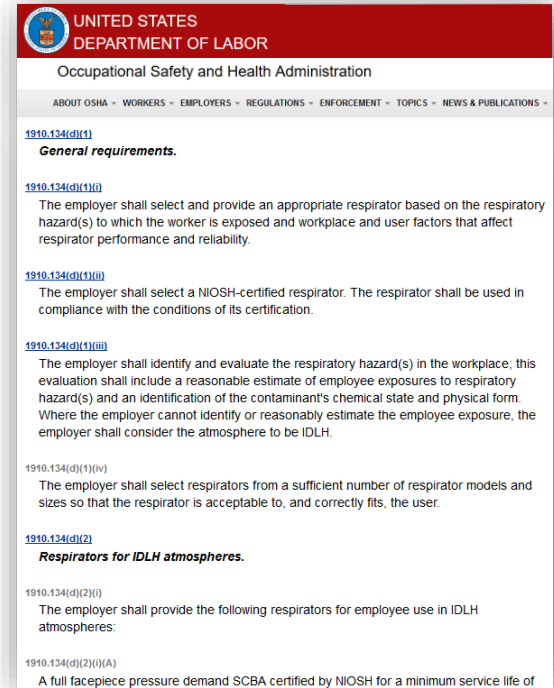


# MISTAKE #3

## Using the wrong respirator and cartridges

### Right respirator **based on hazard**:

- The employer shall identify and evaluate respiratory hazard(s) in workplace.
- This evaluation shall include reasonable estimate of employee exposures to respiratory hazard(s) and identification of contaminant's chemical state and physical form.
- Where employer cannot identify or reasonably estimate employee exposure, employer shall consider atmosphere to be **IDLH**.



UNITED STATES  
DEPARTMENT OF LABOR  
Occupational Safety and Health Administration

ABOUT OSHA - WORKERS - EMPLOYERS - REGULATIONS - ENFORCEMENT - TOPICS - NEWS & PUBLICATIONS -

[1910.134\(d\)\(1\)](#)  
**General requirements.**

[1910.134\(d\)\(1\)\(i\)](#)  
The employer shall select and provide an appropriate respirator based on the respiratory hazard(s) to which the worker is exposed and workplace and user factors that affect respirator performance and reliability.

[1910.134\(d\)\(1\)\(ii\)](#)  
The employer shall select a NIOSH-certified respirator. The respirator shall be used in compliance with the conditions of its certification.

[1910.134\(d\)\(1\)\(iii\)](#)  
The employer shall identify and evaluate the respiratory hazard(s) in the workplace; this evaluation shall include a reasonable estimate of employee exposures to respiratory hazard(s) and an identification of the contaminant's chemical state and physical form. Where the employer cannot identify or reasonably estimate the employee exposure, the employer shall consider the atmosphere to be IDLH.

[1910.134\(d\)\(1\)\(iv\)](#)  
The employer shall select respirators from a sufficient number of respirator models and sizes so that the respirator is acceptable to, and correctly fits, the user.

[1910.134\(d\)\(2\)](#)  
**Respirators for IDLH atmospheres.**

[1910.134\(d\)\(2\)\(i\)](#)  
The employer shall provide the following respirators for employee use in IDLH atmospheres:

[1910.134\(d\)\(2\)\(i\)\(A\)](#)  
A full facepiece pressure demand SCBA certified by NIOSH for a minimum service life of

*OSHA Respirator Regulations, (OSHA 29 CFR 1910.134(d)(1)(iii))*



# MISTAKE #3

Using the wrong respirator and cartridges

A quick look at respirator types

## Air Supplying

SCBA

Air Line

## Air Purifying

Disposable Half Mask

Half Mask

Full Face

PAPR

- Loose fitting hoods
- Helmets
- Tight fitting face-pieces

**Disposable**  
**vs.**  
**Re-Usable**

# MISTAKE #3

## Using the wrong respirator and cartridges

### Self Contained Breathing Apparatus

- Used by Response Teams
- Highly hazardous environments
- Requires “Grade D” Breathing Air
- Specialized training and maintenance



# MISTAKE #3

## Using the wrong respirator and cartridges

### Air Line Supplied Air

- When no approved cartridges
- Certain operations (auto painting)
- Abrasive blasting
- Oxygen deficient atmospheres
- IDLH atmospheres
- Cannot be used in confined spaces



# MISTAKE #3

Using the wrong respirator and cartridges

Powered Air Purifying Respirator (PAPR)

- Tight or loose fitting facepiece, with a wearable battery powered blower to supply purified (filtered) air from the same atmosphere
- Can not be used in atmospheres that are oxygen deficient or IDLH



# MISTAKE #3

## Using the wrong respirator and cartridges

### Air Purifying Respirators (Without PAPR)

**N95 Filtering Facepiece**  
*aka "dust mask"*



**Particulates**  
*Dusts, Mists, Fumes*

**½ Mask Air Purifying**  
*tight fitting, reusable*



**Broad Applications**

**Full-face Air Purifying**  
*tight fitting, reusable*



**Greater Protection**

**Low Protection**

**Low Hazard**

**High Protection**

**High Hazard**



# MISTAKE #3

Using the wrong respirator and cartridges

Filtering Facepiece Respirators - Ratings

Letters: N, R, or P. Refers to resistance to oil.

N is *Not* resistant to oil. R is *Resistant* to oil. P is oil *Proof*

Number: 95, 99, or 100. Refers to the efficiency of filtering out particles of a certain size (0.3  $\mu\text{m}$  in diameter or larger).

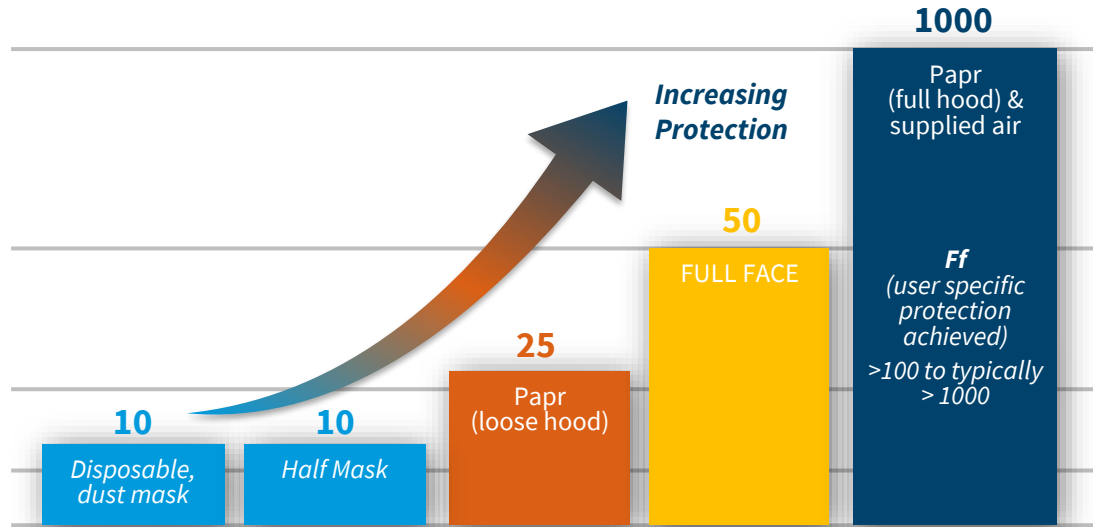
N95 is the lowest level of approved protection.



# MISTAKE #3

## Using the wrong respirator and cartridges

*Assigned Protection Factor (APF)*



# MISTAKE #3

## Using the wrong respirator and cartridges

*Assigned Protection Factor (APF)*



**Half mask/Dust mask**  
APF=10  
*Needs to be fit tested*



**Half mask (Elastomeric)**  
APF=10  
*Needs to be fit tested*



**Full facepiece (Elastomeric)**  
APF=50  
*Needs to be fit tested*

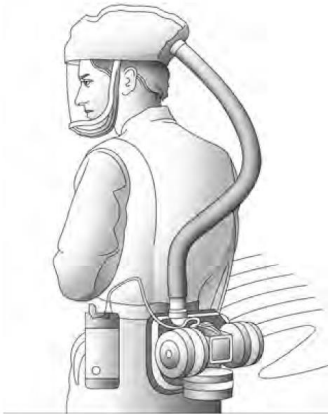
Original illustrations created by Attilis & Associates



# MISTAKE #3

## Using the wrong respirator and cartridges

*Assigned Protection Factor (APF)*



**Loose-Fitting Powered  
Air-Purifying Respirator (PAPR)**  
APF= 25



**Hood Powered Air-Purifying  
Respirator (PAPR)**  
APF= 25



**Full Facepiece Supplied-Air Respirator (SAR)  
with an auxiliary Escape Bottle**  
APF=1,000  
APF = 10,000 (if used in "escape" mode)  
*Needs to be fit tested*



**Full Facepiece Abrasive Blasting  
Continuous Flow**  
APF=1,000  
*Needs to be fit tested*

# MISTAKE #3

## Using the wrong respirator and cartridges

### *Assigned Protection Factor (APF)*



Full Facepiece Self-Contained  
Breathing Apparatus (SCBA)  
Pressure demand mode is APF=10,000  
*Needs to be fit tested*

Assigned protection factor is used to establish the Maximum Use Concentration (MUC). The MUC is determined by multiplying the APF by the PEL.

Example of Acetic Acid and a Half Mask Respirator:  
 $10\text{ppm} \times 10 \text{ (APF)} = 100\text{ppm}$

100ppm is the highest concentration of Acetic Acid in which a half mask respirator can be used

# MISTAKE #3

## Using the wrong respirator and cartridges

Colors indicate type of contaminant cartridge protects against



# MISTAKE #3

## Using the wrong respirator and cartridges

Use correct cartridge for job!

Dusts, Mists, Fumes	Magenta	
Organic Vapor	Black	
Acid Gases	White	
Organic Vapor/Acid Gases	Yellow	
Ammonia/Methylamine	Green	
Formaldehyde/Organic Vapor	Olive/Black	
Multi-Gas/Vapor	Olive	
Mercury Vapor/Chlorine Gas	Orange	

# MISTAKE #3

## Using the wrong respirator and cartridges

### Cartridge Change-Out

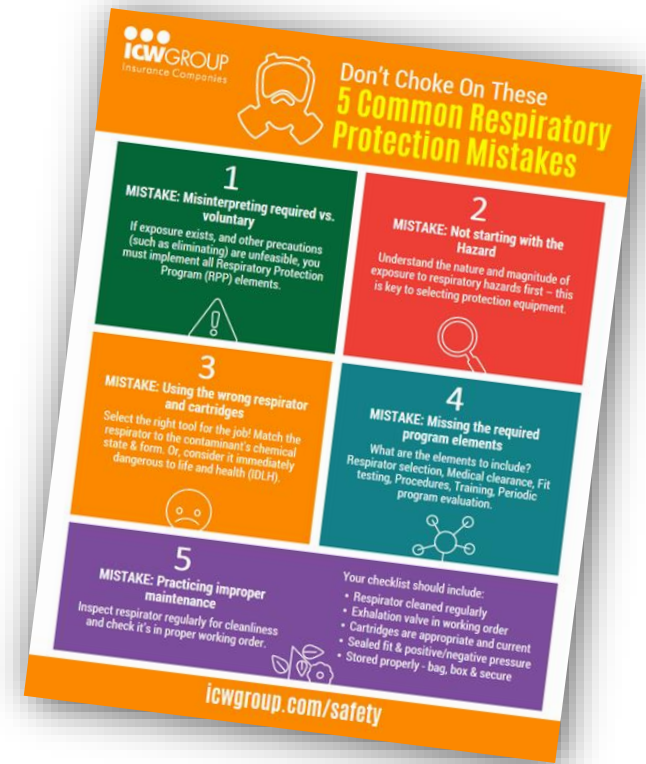
- Previously: Judged by service-life warnings
  - Odor, taste, resistance
- Current: **Schedule required**
  - Filter and chemical cartridge life
  - Manufacturer's recommendation
  - NIOSH MultiVapor e-Tool
  - Service Life Indicators
  - Cartridge marking system

½ Mask with cartridges and  
'pancake' style pre-filters



# Top 5 Most Common Mistakes

1. Misinterpreting required vs. voluntary
2. Not starting by understanding hazard
3. Using wrong respirator and cartridges
4. Missing required program elements
5. Practicing improper maintenance



# MISTAKE #4

## Missing required program elements

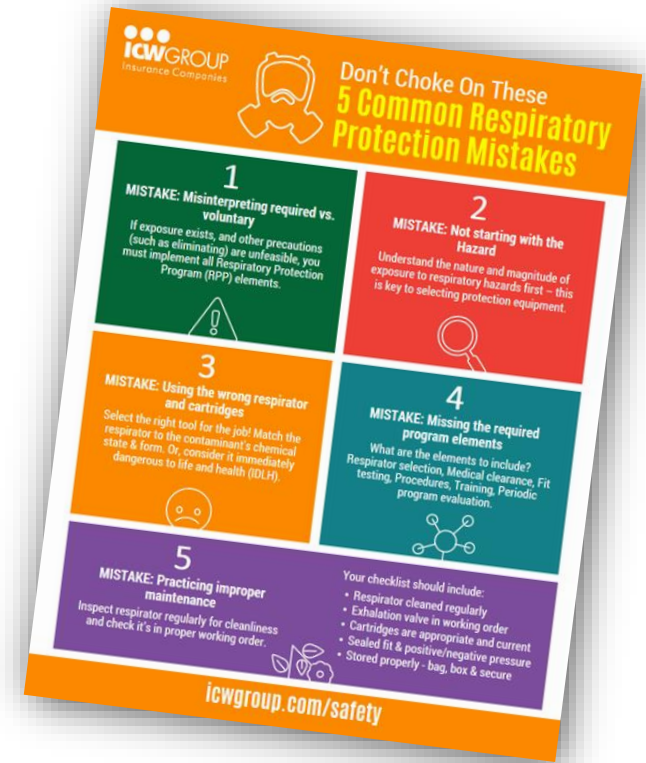
### Required:

1. Written program
2. Program administrator
3. Hazard evaluation & respirators
4. Medical clearance
5. Fit testing
6. Procedures
7. Training
8. Periodic program evaluation
9. Record keeping



# Top 5 Most Common Mistakes

1. Misinterpreting required vs. voluntary
2. Not starting by understanding hazard
3. Using wrong respirator and cartridges
4. Missing required program elements
5. Practicing improper maintenance





# MISTAKE #5

Practicing improper maintenance

## Respirator owner identification

- Inspect regularly
  - Cleanliness
  - Exhalation valve
  - Cartridges
- Check fit
  - Positive/negative pressure



# MISTAKE #5

Practicing improper maintenance

## Cleaning

- Wipes – Use ammonia based wipes (not alcohol)
- Bath – Warm water, mild soap



# MISTAKE #5

Practicing improper maintenance

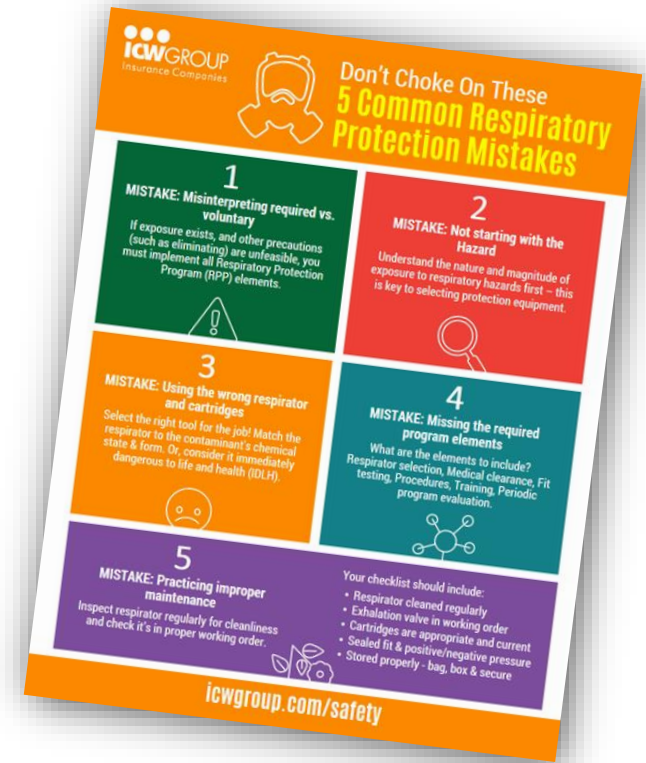
## Storage

- Bagged / boxed / secure



# Top 5 Most Common Mistakes

1. **Know** what's required vs. voluntary
2. **Start** by understanding hazards
3. Use **correct** respirator and cartridges
4. **Include** required program elements
5. Practice **proper** maintenance



# In Closing...

**Understanding Respiratory Requirements and  
Committing to Safety**

=

**Healthier and More Productive Workforce**  
*and sustainable competitive business advantage!*



## **ICW Group Safety & Risk Resources**

# ICW Group Policyholder Website!

[icwgroup.com/safety](http://icwgroup.com/safety)

- Safety and Risk Management area!
- Safety Webinars
- Breathe Easier With These Respiratory Protection Must Haves

**BONUS MATERIALS!** Links to Safety *OnDemand*<sup>®</sup> respiratory protection resources

**5 Common Respiratory Protection Mistakes**

- MISTAKE 1: Misinterpreting required vs. voluntary**  
If exposure exists, and other precautions (such as eliminating) are unfeasible, you must implement all Respiratory Protection Program (RPP) elements.
- MISTAKE 2: Understanding exposure to respirator is key to selection**
- MISTAKE 3: Recordkeeping**
- MISTAKE 4: Hazard evaluation & respirator selection**
- MISTAKE 5: Medical evaluation for respirator wearers**

**TOP TIPS For Respirator Safety**  
Wearing a respirator? Check these tips to be safe!

- 1 Got the correct mask?** Don't just pick any Friday the 13<sup>th</sup> mask. Understand the hazard and the protection you need, then select the right respirator to wear.
- 2 Don't neglect to inspect.** Check your respirator closely before you wear it—cleanliness, cartridge, valve. Do a complete pre-flight. After all, your lungs depend on it!
- 3 Sporting a beard?** Facial hair can impair the face-to-face seal of the respirator and destroy the effectiveness. Sorry, it may look stylish, but save your lungs and shave your beard!
- 4 Reusing disposable filters?** These aren't made for repeated use. Don't hang onto a filter until you can "taste it" (yuck). Here's a bright idea - replace with each use.
- 5 Never read a map?** Start now - read the instructions that came with your respirator. Check to be sure it's designed for the hazard and ensure you're using it properly.

**Key Requirements of Your Respiratory Protection Program**

- 1 Written program with policies and procedures
- 2 Program administrator
- 3 Hazard evaluation & respirator selection
- 4 Medical evaluation for respirator wearers
- 5 Fit testing
- 6 Recordkeeping

**PLAN FOR IMPROVED RESPIRATORY PROTECTION**

Is your Respiratory Protection Program Making an impact? Before you begin, be sure you follow the P.L.A.N. for safety!

**P Prepare** Prepare before starting the hazardous work. Inform employees from the start. Select a Respiratory Protection Program administrator.

**L Learn** Ensure supervisors are ready to help with respirator training, checklists, advice on use, coaching and guidance.

**A Act** Act by following through with your program. Once you've prepared, it's time to complete the task at hand.

**N Note** Note the results for feedback. Reinforce safe behaviors, review those that aren't. Ensure correct respirators are being used the correct way - and that maintenance and storage procedures are being followed.

[icwgroup.com/safety](http://icwgroup.com/safety)

# Safety OnDemand – FREE With Your Policy

Log into **MyResource**

- If not registered, it's easy!
- Click on **Safety OnDemand**
- 5000+ resources available
- Materials in Spanish & English
- Start using it today!

The collage displays various SafetyNow resources:

- Safe Respirator Use Quiz:** A quiz titled "Safe Respirator Use" with questions like "If a facepiece respirator is correctly sealed in a negative pressure test, the respirator will puff out when you hold your breath." and "The main way a supplied-air respirator protects workers is by filtering contaminants from the air."
- Checklist:** A checklist titled "BEFORE THE TALK" and "AFTER THE TALK" with sections for "PREPARATION TIPS" and "CHECKLIST".
- Handout: How to Protect Yourself:** A handout with a photo of a worker wearing a respirator and a list of steps: "6. Make it fit" (Get a good fit, Fitted to, Right type, Mouth-fit, Quarter, Do a fit test) and "Do a fit test" (Negative, Positive).
- Handout: What's at Risk?:** A handout titled "What's at Risk?" discussing the dangers of not using proper respiratory protection.
- Handout: Safe Respirator Use:** A handout titled "Safe Respirator Use" providing detailed instructions on how to use a respirator correctly.

Handouts, checklists, quizzes, safety talks and more!





**QUESTIONS?**



**BREATHE EASIER WITH THESE**  
Respiratory Protection Must Haves

**THANK YOU!**