

Respirators – Which One? Does It Fit?

Matching the respiratory protective device with the situation is as important as selecting the right tool for the job.



Tiny nose masks do not interfere with talking or eating

Vest-Pocket Respirator Guards Workers' Lungs

SMALL enough to be carried in a vest pocket, a one-ounce respirator protects industrial workers against dust with new convenience. The unbreakable, soft rubber device covers the nose alone, so that a wearer can talk, eat, smoke, and don glasses or goggles. While the user breathes naturally through his nose, an ingenious valve exhausts stale air and allows only filtered air to enter. Although the replaceable filter folds to wafer size, its effective area of nine square inches assures easy inhalation. Elastic ear loops hold the respirator.

Popular Science, December 1940.
<http://blog.modernmechanix.com/vest-pocket-respirator-guards-workers-lungs/>



WPS New Requirement

- WPS-labeled pesticide products: Respirator Requirements per OSHA 1910.134
 - Medical Evaluation
 - Fit test
 - Only NIOSH Certified Respirators permitted
 - Training
 - Recordkeeping



WPS Respirator Use

- Follow the:
 - Label
 - WPS medical evaluation, fit testing and cleaning

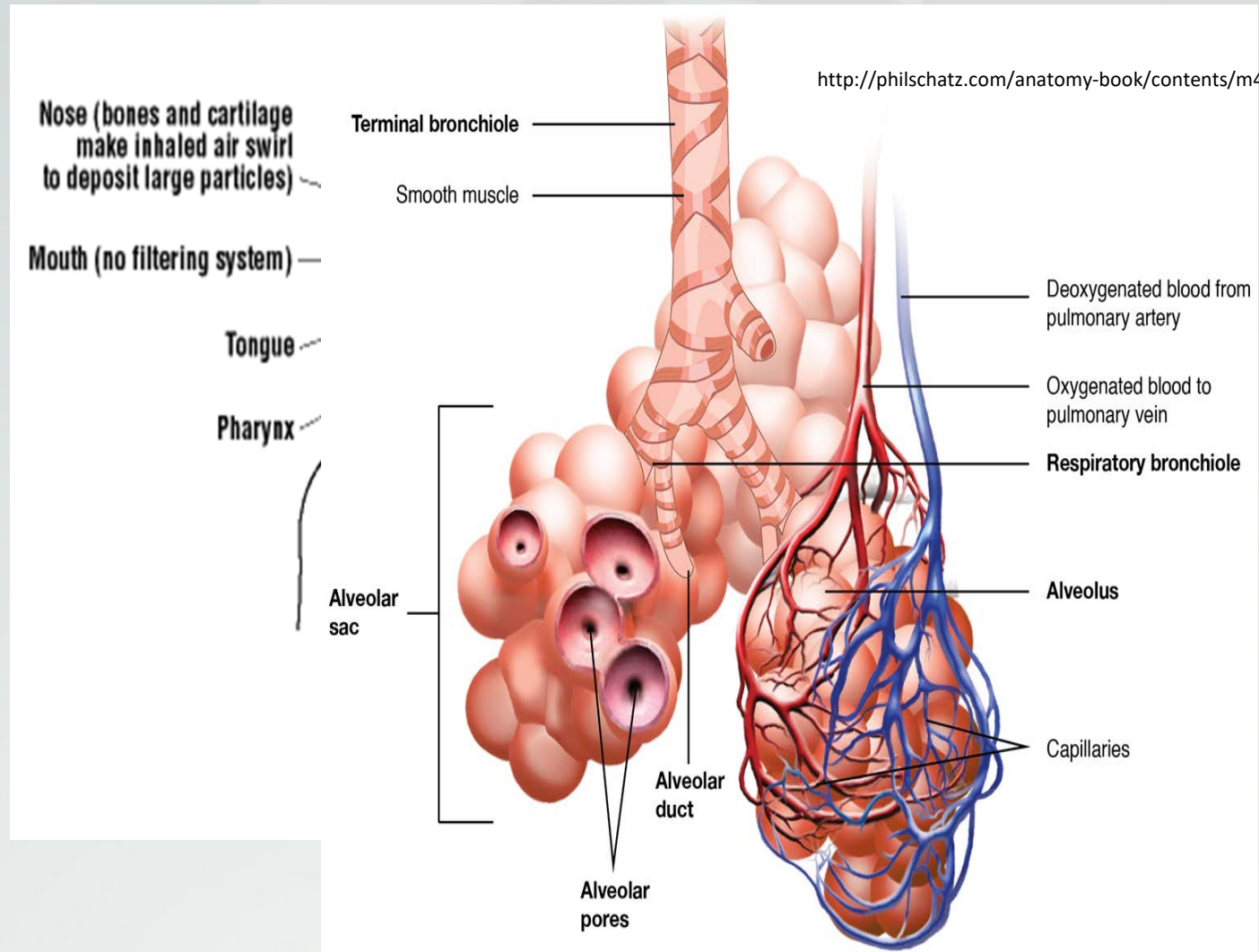
- WPS does not require a written respirator program



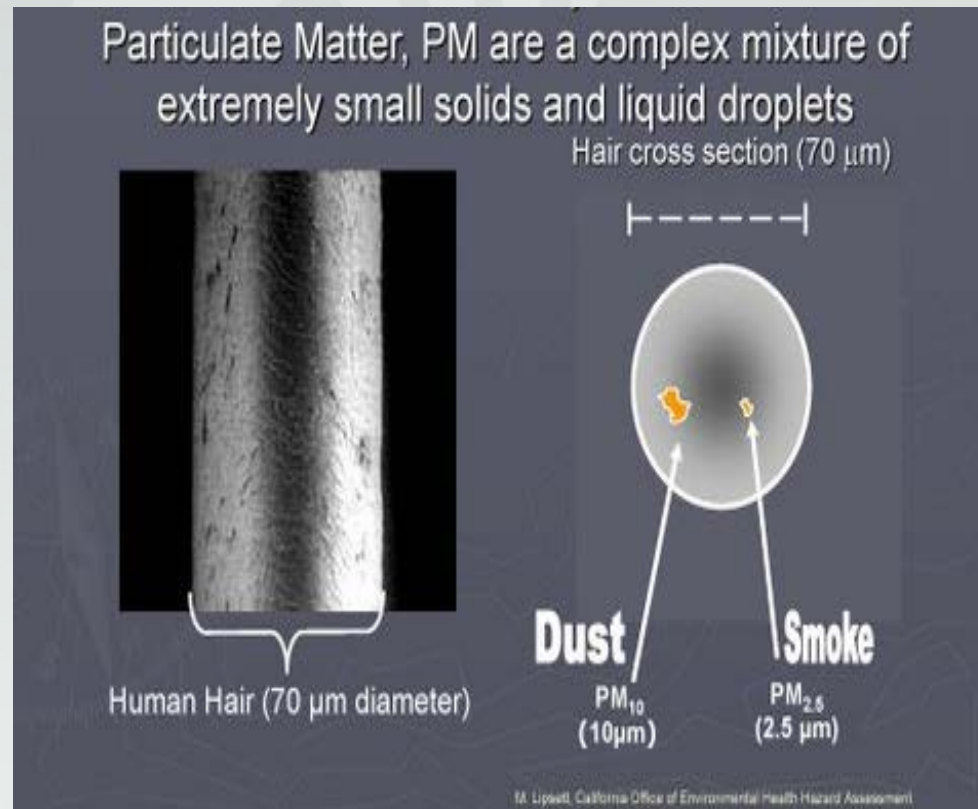
“Ag” Respirator Use

- For non-“Agricultural Use” pesticides and chemicals MIOSHA Part 700 applies
 - Part 700 does not require a written respirator program
- For respirator required “non-agricultural” work activities (even though done on a farm) MIOSHA Part 451 applies
 - Part 451 requires a written respirator program

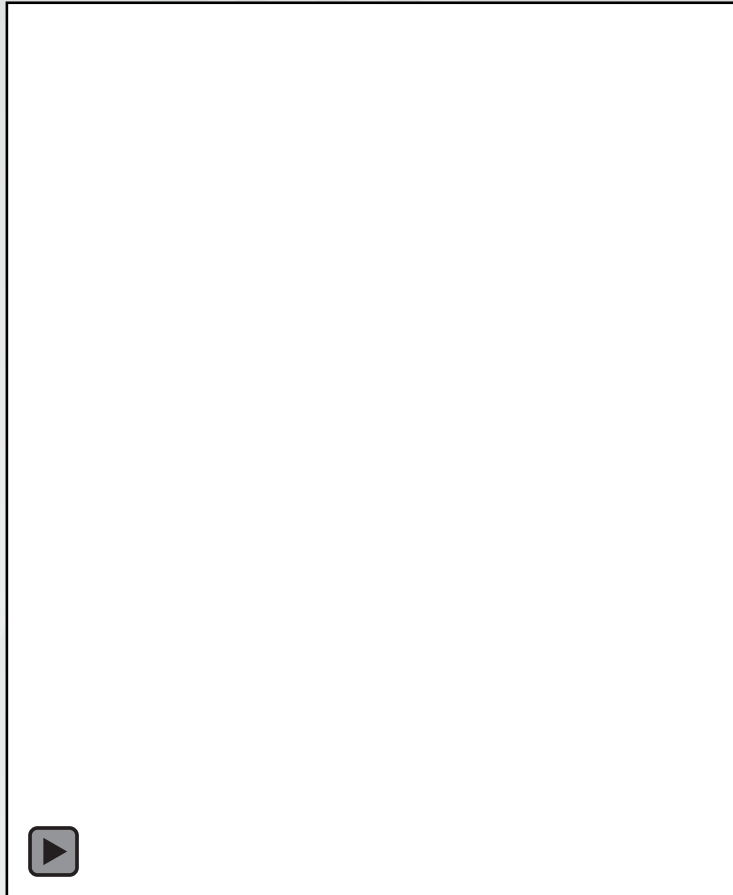
The Respiratory System



Particle Size Matters



Particle Size Matters





Two Classes of Respirators

- ***Air-purifying respirators*** - respirators with an air-purifying device (filter, cartridge/canister) that removes air contaminants before the air is inhaled.
 - Negative Pressure (wearer doing the work)
 - Positive Pressure (pump doing the work)
- ***Atmosphere-supplying respirators*** - provide clean breathing air from an uncontaminated source

Air Purifying Respirators

- Tight Fitting:
 - Medical Evaluation
 - Fit Test
 - User Seal Check
- Loose Fitting:
 - Medical Evaluation

Major Types of Respirators

Air-purifying respirators, which remove contaminants from the air.

Tight Fitting



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



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

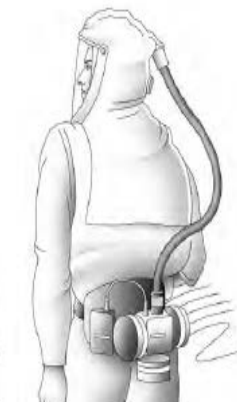


Full facepiece (Elastomeric)
APF=50
Needs to be fit tested

Original illustrations created by Attilis & Associates



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



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

Loose Fitting

Air Purifying, Tight Fitting, Negative Pressure Respirators

- Filtering facepiece (dust mask)
- Elastomeric respirators
 - Uses replaceable filters, canisters and cartridges

OSHA APF = 10



Half-face



OSHA APF = 10

Full-face



OSHA APF = 50

Air Purifying, Loose-Fitting, Positive Pressure Respirators



3M OSHA APF=1000



OSHA APF = 25

Uses replaceable filter
(mounted in helmet)



Choosing a Respirator

- Depends upon:
 - Type and concentration of contaminant
 - Need for eye, face protection
 - Need for supplemental air/oxygen
 - *Presence of facial hair*
- Make sure NIOSH certified



Choosing a Respirator: Facial Hair Dilemma

Facial Hairstyles and Filtering Facepiece Respirators



*If your respirator has an exhalation valve, some of these styles may interfere with the valve working properly if the facial hair comes in contact with it.
 †This graphic may not include all types of facial hairstyles. For any style, hair should not cross under the respirator sealing surface.

Source: OSHA Respiratory Protection Standard

https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=standards&p_id=12716

Further Reading: NIOSH Respirator Trusted-Source Webpage

https://www.cdc.gov/miosha/nptl/topics/respirators/disp_part/respsource3fitest.html



NIOSH Approval System for Particulate Filters

- **N95/R95/P95** masks filter out 95% of dust particles
 - N**=Not resistant to oil,
 - R**=Somewhat resistant to oil,
 - P**=Strongly resistant to oil
- **N99/R99/P99** masks filter out 99% of dust particles
- **N100/R100/P100** masks filter out 99.97% of dust particles



https://www.cdc.gov/niosh/npptl/topics/respirators/disp_part/respsource1quest2.html



<http://www.gemplers.com/images/items/8293-lrg.jpg>

**Choose Filter
Efficiency
(95%, 99%, 99.97%)**

YES

**Does the
Aerosol Contain
Oil?**

NO

YES

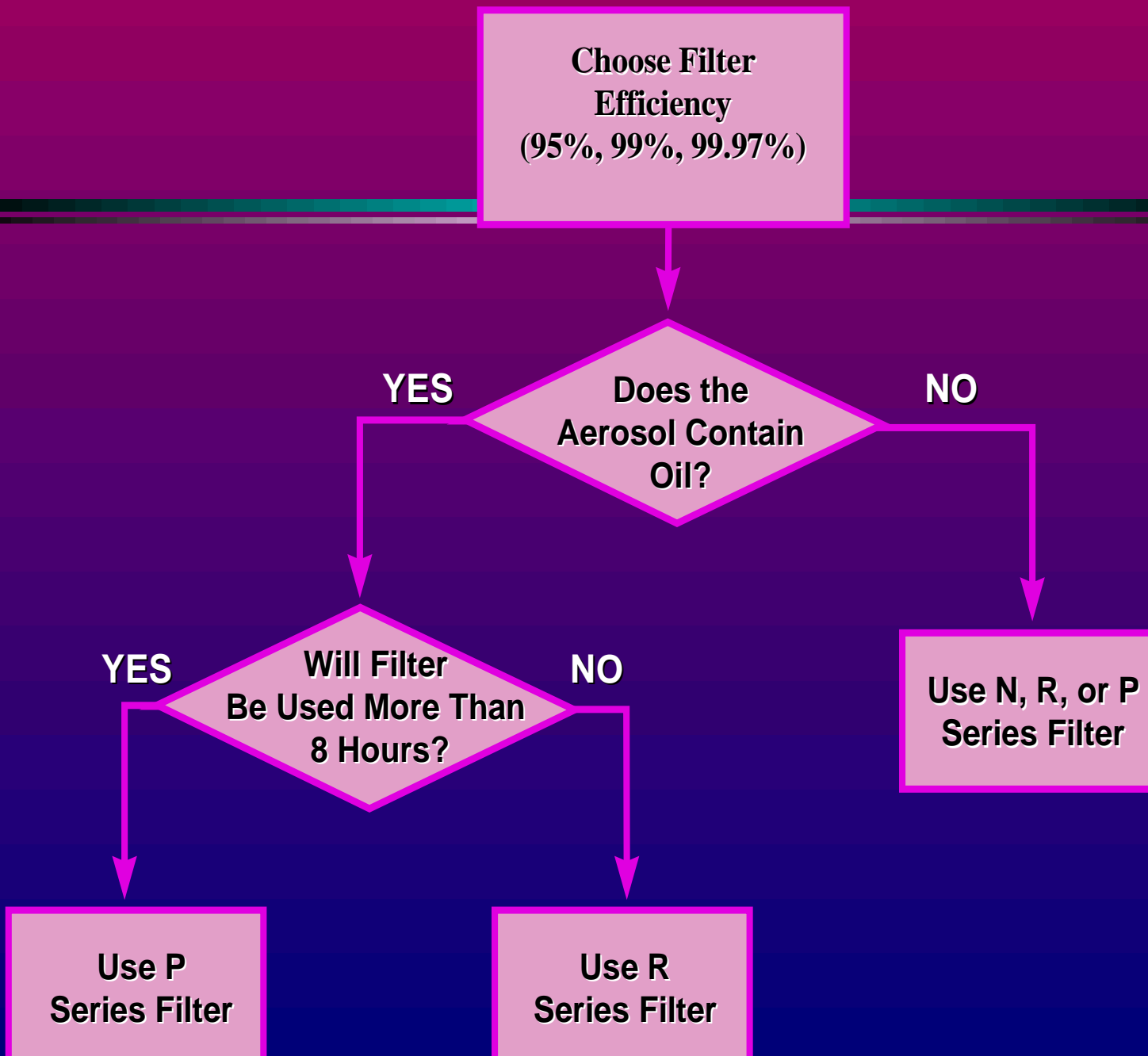
**Will Filter
Be Used More Than
8 Hours?**

NO

**Use P
Series Filter**

**Use R
Series Filter**

**Use N, R, or P
Series Filter**



Dust Masks (filtering facepieces)

- Dust masks capture airborne particles (dust, mist, fumes) but not gases or vapors (unless equipped with charcoal layer)
- Specific WPS rules for filter replacement
 - Family farm owner exempt



https://farm3.staticflickr.com/2794/4211215059_d80da56913_z.jpg

Half Mask/Full Face

- Gas & Vapor cartridge
 - Chemical cartridges trap different types of chemicals, but not dusts, mists or fumes
- Particulate cartridge
 - Trap particulates only
- Combination cartridge
 - Will trap both gas/vapor + particulate





Powered Air Purifying Respirators

- Has battery-powered fan that draws air through cartridges and blows it into the facepiece
- Can provide better protection than other cartridge respirators
 - Special filter: Only HE (High Efficiency) filters used: Filters at least 99.97% of airborne particles.



Air Supplied

- Air supplied from another source
 - Medical evaluation
 - Fit Test

Atmosphere-supplying respirators, which provide clean air from an uncontaminated source.



**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

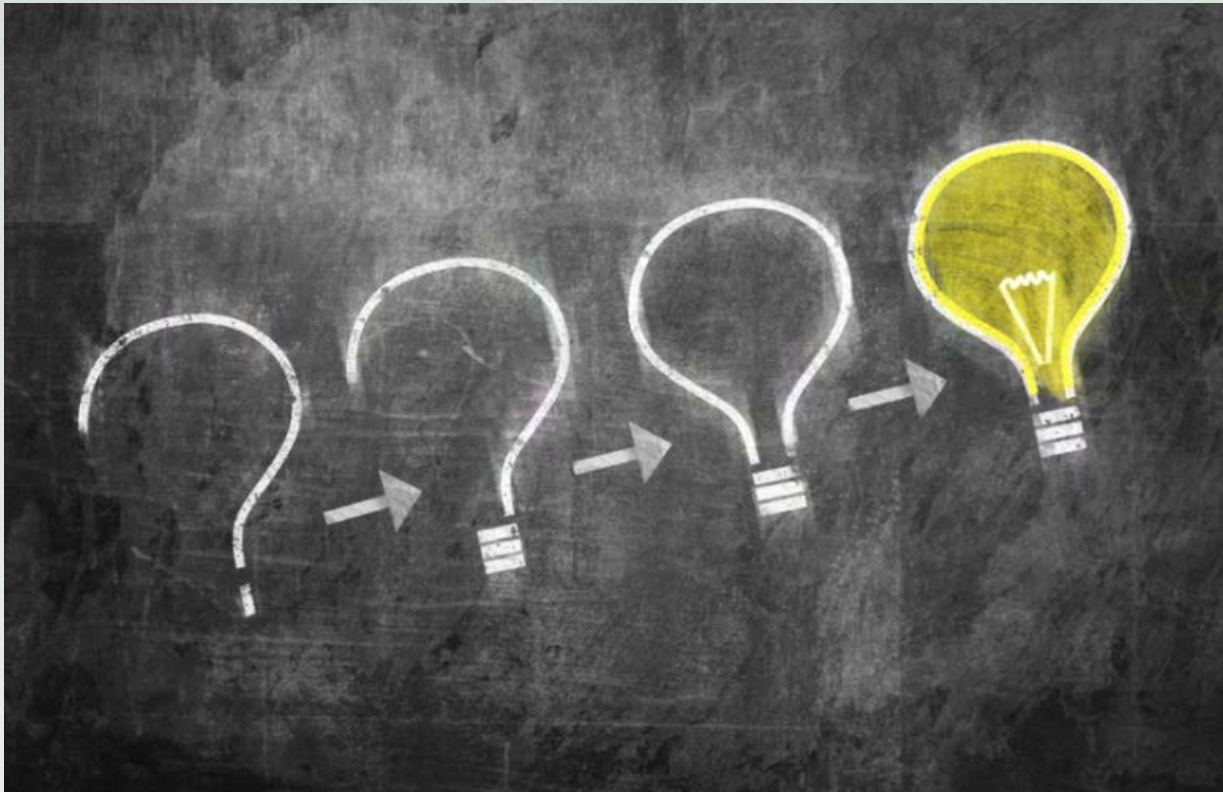


**Full Facepiece Abrasive Blasting
Continuous Flow**
APF=1,000
Needs to be fit tested



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

Questions?





Deciphering a Pesticide Label

PULL HERE TO OPEN →

RESTRICTED USE PESTICIDE
DUE TO ACUTE TOXICITY

FOR RETAIL SALE TO AND USE ONLY BY CERTIFIED APPLICATORS OR PERSONS UNDER THEIR DIRECT SUPERVISION
AND ONLY FOR THOSE USES COVERED BY THE CERTIFIED APPLICATOR'S CERTIFICATION.

 **Gramoxone Inteon®**


 **syngenta.**

Herbicide
A Weed, Grass, and Harvest Aid
Desiccant/Defoliant Herbicide

Active Ingredients:

Paraquat dichloride (1,1-dimethyl-4,4'-bipyridinium dichloride)	50.9%
Other Ingredients:	49.0%
Total:	100.0%

Contains 2.0 pounds paraquat cation per gallon
as 2.162 pounds salt per gallon.
Contains desiccant-herbicides, emulsifiers, and
other technology.

**KEEP OUT OF REACH
OF CHILDREN.
DANGER /
PELIGRO
POISON** 

Si usted no entiende la etiqueta, busque a
alguien para que se la explique o usted en
detalle. (If you do not understand the label,
find someone to explain it to you in detail.)

- NEVER PUT INTO FOOD, DRINK OR OTHER
CONTAINERS.
- IF SWALLOWED, TAKE IMMEDIATE ACTION
AS PRESCRIBED IN FIRST AID STATEMENT.
SYMPTOMS ARE PROLONGED AND PAINFUL.
- DO NOT USE OR STORE IN OR AROUND THE
HOME.
- DO NOT REMOVE CONTENTS EXCEPT FOR
IMMEDIATE USE.
- THE COLOR OF THIS PRODUCT IS FROM THE
ALERTING AGENT WHICH HAS BEEN ADDED,
NOT FROM PARAQUAT.

EPA Reg. No. 600-1217
EPA Est. 100-LA-001
Product of the United Kingdom
Formulated in the USA
SCP 1217A-L1D 0610
323046

2.5 gallons
Net Contents

When applying any pesticide, remember that the label is the law.



42 CFR Part 84 Rule Changes Changed Respirator Certifications

- July 1995: National Institute of Occupational Safety and Health (NIOSH) upgraded the tests used to certify **non-powered air purifying particulate respirators**. TC: Test and Certify
 - Does not change chemical cartridge, SCBA, airline, gas mask, PAPR types
- Testing requirements for the following respirators or filters are eliminated:
 - Single use dust/mist respirators
 - Dust/mist respirators
 - Dust/mist/fume respirators
 - Radon daughter respirators
 - Pesticide prefilters
 - Paint spray prefilters

NIOSH TC Designations

- **Air Supplied Respirators**
 - 13F: self-contained breathing apparatus (SCBA)
 - 19C: supplied air respirator (SAR)
- **Air Purifying Respirators**
 - 14G: gas mask with canister
 - 23C: air-purifying respirator (APR) with chemical cartridge
 - Half- or full-facepiece
 - 84A: respirator with particulate filter or combination chemical cartridge with particulate filter
 - Filtering facepiece
 - Half- or full-facepiece
- **Powered Air Purifying Respirators**
 - 23C: powered air-purifying respirator (PAPR) with chemical cartridge and particulate filter
 - 21C: powered air-purifying respirator (PAPR) with particulate filter

Translation Key for Respirator on EPA labels

OUTDATED Respirator terms used on EPA pesticide labels	Current NIOSH respirator terms used on labels
NIOSH/MSHA	NIOSH
Dust/Mist	Particulate
Pre-filter approved for pesticides	N, R, or P filter, to be used in combination with a chemical cartridge
Canister approved for pesticides	Canister (contaminant specific)
N, R, P or HE filters	N, R or P (HE filters can only be used on Powered Air-Purifying Respirators (PAPRs))



Label Example

- Mixer Loaders, applicators and all other handlers must wear ...
- And NIOSH approved **dust/mist filtering respirator** (MSHA/NIOSH approval number prefix **TC-21C** or a **NIOSH approved respirator with any N, R, P or HE filter**

Remember! Dust Mist = Particulate

- **NIOSH Particulate Respirators**



TC-21C



TC-84A



TC-84A



TC-84A

Label Language

- For exposures in enclosed areas wear a respirator with an organic vapor removing cartridge with a pre-filter approved for pesticides (MSHA/NIOSH approval number prefix TC-23C)

TC-23C



Correct??

**Look for the
COMPONENTS:
not the number!**

Correct??

TC-84A



NIOSH TC-84A vs TC-23C

TC-84A



Organic Vapor with combination N95 filter

TC-23C



Organic Vapor Cartridge only

Personal Protective Equipment (PPE)

Applicators and other handlers (other than Mixers and Loaders) must wear:

- Long-sleeve shirt and long pants
- Shoes plus socks
- Protective eyewear
- Chemical Resistant Gloves - Category A (e.g. barrier laminate, butyl rubber, nitrile rubber, neoprene rubber, natural rubber, polyethylene, polyvinyl chloride (PVC) or Viton®)
- A dust mist NIOSH-approved respirator with any N, R, P, or HE filter

- A NIOSH approved particulate respirator with any N, R or P filter (NIOSH approval TC-84A); or a powered air purifying respirator (PAPR) with HE filters (NIOSH approval TC-21C)



- A respirator with an organic-vapor removing cartridge with a prefilter approved for pesticides (MSHA/NIOSH approval number prefix TC-23C), or a canister approved for pesticides (MSH/NIOSH-approval number prefix TC-14G), or a NIOSH-approved respirator with an organic vapor (OV) cartridge or canister with any N, R, P or HE prefilter

- A NIOSH approved respirator with an organic vapor (OV) removing cartridge with any combination N, R, or P filter (NIOSH approval number prefix TC-84A); or an OV canister (NIOSH approval prefix TC-14G; or a powered air purifying respirator (PAPR) with HE filters (NIOSH approval prefix TC-23)



NIOSH Approval
#TC-84A Air
Purifying full-face
respirator with
combination OV
cartridge and N-type
particulate filter.



Bottom Line...

- The respirator you use must fit you and be right for the job that you do!

