

INTRODUCTION

This *Guide* may be used as an aid to select appropriate respiratory protection for specific contaminants. Because conditions at the worksite can vary substantially, a comprehensive evaluation must be made to determine the correct respiratory protection. When contaminants at a worksite have been identified and concentrations measured, this *Guide* may be used to help select the appropriate respirator. Only qualified professionals, familiar with the actual working conditions and knowledgeable in the benefits and the limitations of respiratory protection equipment, should make the selection. Once a respirator has been selected, it is important to continually monitor its effectiveness, as well as the dynamic worksite situation. If selection criteria changes, including but not limited to worksite conditions or standards and regulations, a new evaluation must be made to determine the appropriate respiratory protection.

*COMPREHENSIVE RESPIRATORY PROTECTION PROGRAM

Wherever respirators are used in a work environment, a comprehensive respiratory protection program must be implemented in accordance with OSHA 29 CFR 1910.134, as a minimum. This regulation covers permissible practice, written programs, training, maintenance and care, selection, use, fit testing, cleaning and storage, medical evaluation, breathing air quality, identification of filters and cartridges, program evaluation, and record keeping. When a chemical cartridge respirator is used, it can only be used if a cartridge change schedule is developed in accordance with 29 CFR 1910.134 (d)(3)(III)(B)(2). If a change schedule is not developed you should not use Moldex respirators. See pages 29-31 for more information.

RESPIRATOR FIT TESTS

Any respirator used by an employee must be fit tested to ensure that the respirator is providing adequate protection to the wearer. All Moldex respirator users should be fit tested to ensure proper fit of the respirator. OSHA 1910.134 describes the various types of fit tests that may be utilized.

ASSIGNED PROTECTION FACTORS (APF)

All Moldex respirators listed in this *Guide* are half mask or full face, negative pressure, air purifying respirators. Generally, these are assigned an APF of 10 or 50 respectively, unless a specific OSHA, Federal, State or Local standard assigns a lower APF for a particular class of respirator to be used to protect against a particular substance. In such cases the lower APF must be used. A full facepiece respirator fitted using a qualitative fit test only receives an APF of 10.

OTHER PERSONAL PROTECTIVE EQUIPMENT (PPE)

Certain chemicals may require other forms of PPE in addition to respirators due to absorption or damage to the skin, eyes or mucous membranes. When supplying respiratory protective equipment, other PPE must also be considered. Failure to provide appropriate protection with certain chemicals may result in adverse health effects and render the use of a respirator ineffective. Lastly, always consider all the hazards that an employee may be exposed to and the advantages and disadvantages of using a particular piece of equipment in concert with other items (e.g. hard hats, gloves, faceshields, etc.).

When using any Moldex respirator, read all applicable warnings and information provided with it. Not all Moldex respirators have been sold with warnings or use instructions for personnel involved in healthcare or related situations, where there may be the possibility of contact with disease or biological hazards. If you are considering such uses, first call the Moldex Technical Dept., +1 (310) 837-6500 ext. 512/550 or +1 (800) 421-0668 ext. 512/550. See additional warnings in packaging or Moldex Website or page 4 of this guide.

EXPLANATION OF GUIDE FORMAT

Chemical Names listed are either those used by OSHA in 29 CFR 1910.1000, NIOSH's Pocket Guide to Chemical Hazards or ACGIH's 2023 Guide to Occupational Exposure Values. Only substances that have OSHA Permissible Exposure Limits (PEL) and/or American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLV) are listed in the Moldex suggestions section of this guide, when appropriate.

CAS Numbers are below the name of most chemicals and are the Chemical Abstracts Service (CAS) registry number. This number is unique for each chemical.

Synonyms listed are some of those common "other" names of a substance found in various references, this list is not all inclusive.

Filter Type generally indicates what type of filter and/or cartridge may be considered for protection from a particular substance. Remember these suggestions are not absolute. Selection must be based on consideration of the work and use situation encountered in a particular environment. Consider all the contaminants in the workplace. The contaminants may require combinations of cartridges and filters. Only use combinations in approved configurations.

** "N" means Dusts and Non-Oil Based Mists

"R" means Dusts, and Oil and Non-Oil Based Mists with time restrictions

"P" means Dusts and Oil and Non-Oil Based Mists, extended life for Dusts and Non-Oil Based Mists (see Moldex time restrictions on instructions)

"AM" means Ammonia/Methylamine

"AG" means Acid Gas

"FORM" means Formaldehyde

"OV" means Organic Vapor

"OV/AG" means Organic Vapor/Acid Gas

"MULTI" means Multi Gas/Vapor

"95" means 95% efficient

"99" means 99% efficient

"100" means 99.97% efficient

"/" means OR. For example, 8940/8990 means you may use either filter.

"FF" means full face respirator; 9000 is suggested.

***Respirator users outside of the United States must comply with all their applicable regulations.**

****Any non-water based liquids or mist should be considered oil-based, as well as particulates that may have absorbed non-water-based component.**

Note that combinations of the above may be listed. Also note that combination Moldex cartridges (7300/8300) may be used where an OV or AG is listed, but the service life of the cartridge will be considerably less for the particular substance. A similar situation of reduced service life exists with the 7600/8600 multi-gas cartridges used against various contaminants, see instructions for specific information.

Moldex Suggestions are the Moldex respirators that are appropriate for protection from the substance listed. **For example**, remember, anywhere a basic Moldex "N95" is suggested the 2400N95 (2800N95) or 2500N95 (2940R95) may also be used.

The 2400N95 or 2800N95 is usually suggested where protection from dusts or non-oil based mists is required and nuisance level (below the PEL) organic vapor odors are also present. The 2500N95 is usually suggested where protection from dusts or non-oil based mists is required and nuisance level (below the PEL) acid gas irritants are also present and 2940R95 for dusts and both oil and non-oil based mist.

Additionally, any situation where a particular Moldex product is suggested you may move to a higher level of protection provided the type of protection is equivalent. **For example**,

- you may use the 2310N99 in place of the 2200N95 if dust or non-oil based mist protection is required;

- you may use the 7740, 7740+, 7940 or 8940 in place of the 2310N99 if protection from a dust, fume or mist is required;

- you may use any N99 respirator/filter in place of any N95 respirator/filter.

- you may go from a half mask facepiece respirator to a full facepiece respirator with equivalent or higher filters/cartridges.

BUT

- you may not go from 2200N95 to 7100/7107/8100 to protect against a fume because 7100/7107/8100 is used to protect against organic vapors only;

AND

- you may not go from a 7740, 7740+, 7940P100, or 8940P100 to a 2300N95 to protect against things such as lead because lead requires an N, R, or P100 filter, or from a 2730N100 to a 2400N95 because the efficiency level is lower.

- you may not go down from a full facepiece to a half mask without proper evaluation of the workplace.

- Note: Where oil based aerosols are present only an R or P Series filter may be used. Moldex suggests that you assume that any non-aqueous liquid is oil-based.

TLV's and PEL's are listed where either one or both exist. We suggest that in cases where both a TLV and PEL exist for a particular substance, that the lower of the two be used. You must also check if state and local regulations may be applicable.

An "o" next to exposure limit indicates it is an OSHA PEL. A "t" indicates it is an ACGIH TLV.

Exposure limit concentrations may be listed as either ppm (parts per million), or mg/m³ (milligrams per cubic meter),mppcf (million particles per cubic foot) or f/cc (fibers per cubic centimeter of air).

All exposure limits refer to 8 hours per day, 40 hours per week Time Weighted Averages (TWA), unless otherwise stated.

If a "c" appears next to a limit this indicates that it is a ceiling value which refers to the concentration that should not be exceeded at any time during work exposure. If an "s" appears next to a limit this indicates that it is a short term exposure limit (STEL), which refers to a 15 minute TWA (unless otherwise indicated), which shall not be exceeded during a workday.

Both "s" and/or "c" designations may be in addition to or in lieu of another exposure limit.

t-SL - Threshold Limit Value-Surface Limit. The concentration on workplace equipment and facility surfaces that is not likely to result in adverse effects following dermal exposure or incidental ingestion.

A "skin" designation indicates that the substance can be absorbed through the skin, eyes or mucous membranes and appropriate measures must be taken to avoid absorption.

A "SEN" indicates TLV-confirmed potential for worker sensitization as a result of dermal contact and/or inhalation exposure based on the weight of scientific evidence.

A "DSEN" designation indicates that the substance may cause dermal sensitization resulting from the interaction of the absorbed agent and ultraviolet light (i.e. photosensitization).

A "RSEN" designation indicates the substance may cause respiratory sensitization.

A "OTO" designation highlights the potential for a chemical to cause hearing impairment alone or in combination with noise, even below 85dBA.

For more specific definitions refer to 29 CFR 1910.1000 and to the ACGIH TLV Booklet.

IDLH (Immediately Dangerous to Life and Health) and LEL (Lower Explosion Limit) are levels taken directly from the 2007 NIOSH Pocket Guide to Chemical Hazards. In cases where the LEL is listed it is considered as IDLH. In all cases the LEL is listed as 10% LEL to provide a safety factor against explosion.

N.D. means not determined.

Comments list any additional points that should be noted such as:

- If a substance is a carcinogen or a suspected carcinogen, it is listed here. Note that only when OSHA or ACGIH consider a substance a carcinogen or suspected carcinogen it is listed. Carcinogen or suspected carcinogen from any other organizations or agencies have not been included in this *Guide*.

ACGIH designates carcinogens as follows:

TLV-A1: Confirmed Human Carcinogen. The agent is carcinogenic to (t-A1) humans based upon the weight of evidence from epidemiologic studies.

TLV-A2: Suspected Human Carcinogen. Human data are accepted as (t-A2) adequate in quality but are conflicting or insufficient to classify the agent as a confirmed human carcinogen; OR, the agent is carcinogenic in experimental animals at dose(s), by route(s) of exposure, at site(s), of histologic type(s), or by mechanism(s) considered relevant to worker exposure. The A2 is used primarily when there is limited evidence of carcinogenicity in humans and sufficient evidence of carcinogenicity in experimental animals is supported by mechanistic evidence of key characteristics of carcinogens that are relevant to humans.

TLV-A3: Confirmed Animal Carcinogen with Unknown Relevance to Humans: (t-A3) The agent is carcinogenic in experimental animals at a relatively high dose, by route(s) of administration, at site(s), of histologic type(s), or by mechanism(s) that may not be relevant to worker exposure. Available epidemiologic studies do not confirm an increased risk of cancer in exposed humans. Available experimental animal evidence suggests mechanism(s) and/or dosimetry that the agent is unlikely to cause cancer in humans except under improbable routes or levels of exposure.

TLV-A4: Not Classifiable as a Human Carcinogen: Agents which cause (t-A4) concern that they could be carcinogenic for humans, but which can not be assessed conclusively because of a lack of data. *In vitro* or animal studies do not provide mechanistic evidence of key characteristics of carcinogenicity which are sufficient to classify the agent into one of the other categories.

TLV-A5: Not Suspected as a Human Carcinogen: The agent is not suspected (t-A5) to be a human carcinogen on the basis of properly conducted epidemiologic studies in humans. These studies have sufficiently long follow-up, reliable exposure histories, sufficiently high dose, and adequate statistical power to conclude that exposure to the agent does not convey a significant risk of cancer to humans; OR, the evidence suggesting a lack of carcinogenicity in experimental animals is supported by mechanistic data demonstrating a lack of the key characteristics of carcinogenicity.

Substances for which no human or experimental animal carcinogenic data have been reported are assigned no carcinogen designation.

Exposures to carcinogens must be kept to a minimum. Workers exposed to A1 carcinogens without a TLV should be properly equipped to eliminate to the fullest extent possible all exposure to the carcinogen. For A1 carcinogens with a TLV and for A2 and A3 carcinogens, worker exposure by all routes should be carefully controlled to levels as low as reasonably achievable below the TLV.

OSHA designates carcinogens as follows:

CA: Carcinogen defined with no further categorization.

Additionally,

- If specific OSHA standards exist for a substance, it is listed in this section.
- If OSHA is in the process of changing the regulation of a particular substance, it is listed as "OSHA in the process of 6b rulemaking."
- If ACGIH intends to change a TLV or a carcinogen designation, it is listed as "ACGIH NIC (Notice of Intended Change)."
- If ACGIH has a Biological Exposure Indices (BEI), it is listed as "Substance for which an ACGIH BEI exists." Note: ACGIH should be consulted for further detail when BEI is listed.
- If ACGIH intends to change a short term exposure limit or ceiling value, it is listed as ACGIH NIC STEL/CEIL.
- If ACGIH has a threshold value - surface limit, the concentration on workplace surfaces that is not likely to result in adverse effects following derma exposure or incidental ingestion, it is listed as †-SL.

Pages 32-34 contains names of chemicals that Moldex does not recommend its respirators to be used against. Refer to this list when you are not able to locate a chemical in the *Guide* as it may be listed there. Moldex does not make suggestions for chemicals not listed in the *Guide*.

Short service life means that cartridge will have a low service life.

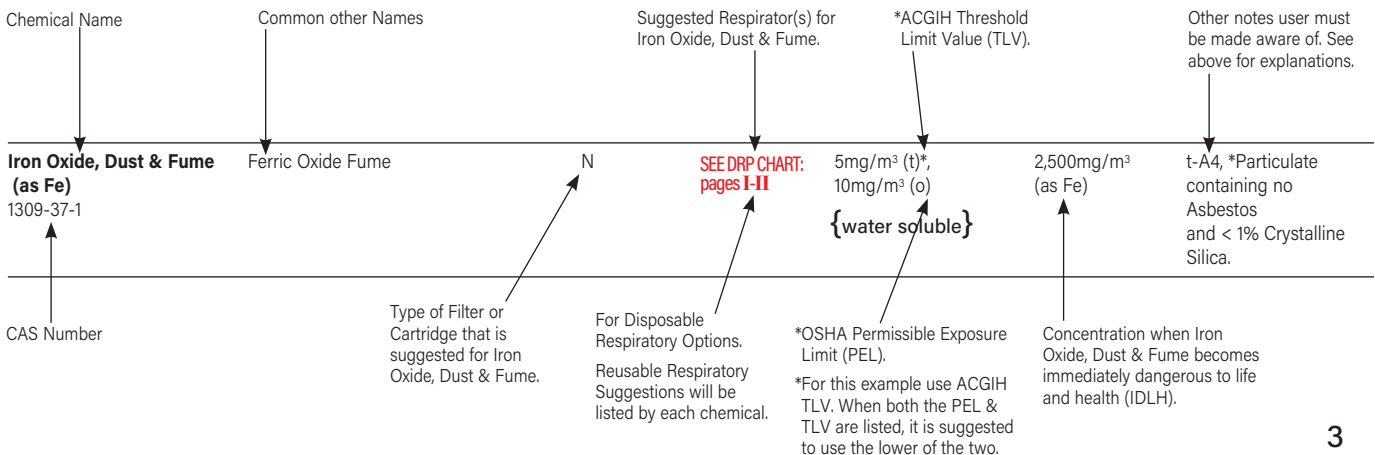
REFERENCES:

AIR CONTAMINANTS - PERMISSIBLE EXPOSURE LIMITS TITLE 29 CFR1910.1000
U.S. Department of Labor, Occupational Safety and Health Administration

POCKET GUIDE TO CHEMICAL HAZARDS U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Institute for Occupational Safety and Health, 2007

2020 GUIDE TO OCCUPATIONAL EXPOSURE VALUES
American Conference of Governmental Industrial Hygienists, 2019

Example on how to use the Moldex 2024 Chemical Selection Guide



SUPPLEMENTAL HAZARD WARNINGS FOR MOLDEX PARTICULATE RESPIRATORS

These are **Warnings and Limitations** that all users must be made aware of in addition to all warnings and other information on the outside of the Moldex respirator packaging or other published related information. **You must read and comply with these Warnings and Limitations at all times** and if your employer has determined that it is appropriate to use this respirator.

Proper use of this respirator may reduce but will not eliminate the risk of illness or death from exposure to some Chemical, Biological, Radiological, or Nuclear (CBRN) hazards. CBRN hazards include, but are not limited to, bacteria, toxins, and viruses that can cause death, serious bodily injury or disfigurement. The long-range and short-range risks of CBRN hazards and the amount and manner of exposure that may produce such risks remain to a great extent unknown. Use of this respirator must be in accordance with the Centers for Disease Control (CDC) Health Advisories or any other Local, State or Federal recommendations for use of respirators against specific CBRN hazards. This respirator should not be used for many CBRN hazards.

There are more efficient models of respirators with a higher level of protection available from Moldex and other manufacturers. It is up to the employer, and not Moldex, to determine if a respirator should be worn and if so, which type, size, level of protection, and model.

BACKGROUND

The National Institute for Occupational Safety and Health (NIOSH), a branch of the CDC and a U.S. Government agency, is responsible for testing and certifying respirators for protection against hazardous industrial contaminants. Procedures for selecting and using proper respiratory protection are regulated by various governmental agencies, such as the Occupational Safety and Health Administration (OSHA).

NIOSH tests and certifies certain respirators for use against chemical warfare agents, biological warfare agents or biohazards and provides advisory information for some biohazards, but OSHA and other government agencies have not set any exposure standards for these agents or biohazards, in general.

Moldex does not make recommendations for any type of respirator to be used against CBRN hazards for workers or the general public.

You should know that there may be no obvious warnings of the presence or release of CBRN hazards.

WARNINGS FOR ALL USERS

- This respirator must only be used for substances having Permissible Exposure Limits (PELs) and only where deemed appropriate by your employer.
- This respirator must be fit tested. If you cannot obtain a proper fit, do not use the respirator and do not enter the risk area.
- This respirator is not for use with beards or other facial hair that prevents direct contact between the face and sealing surface of the respirator.
- Moldex respirators, when properly fitted and used as part of a comprehensive respiratory protection program, may reduce wearer exposure to some airborne hazards, but not all.
- In the event of a sudden or unexpected CBRN hazard release, you may use this respirator for escape only if you have not been provided with a more appropriate respirator for this type of situation. Do not remove the mask from the face until you have left the contaminated area.
- Do not reuse or store for reuse or hang around neck unless your employer specifically authorizes reuse. Dispose of respirator as a hazardous waste in accordance with your employer's directions.
- Use other personal protective equipment, as directed by your employer. Where appropriate use protective gloves when handling or removing respirator and dispose of respirator and then gloves in accordance with your employer's directions.
- If CDC or other Local, State or Federal agency issues new or revised guidelines for respirator use against specific hazards, users must strictly comply.

WARNINGS FOR USE OF PARTICULATE RESPIRATORS AGAINST BIOHAZARDS

OSHA and CDC have recommended the use of any of the particulate respirators approved under 42CFR84 as a means of providing help in complying with a program designed to reduce occupational exposure to biohazards including but not limited to tuberculosis, COVID-19 or other airborne biological hazards.

The level of effectiveness of respiratory protection from biohazards cannot be determined with currently available data. However, proper use of appropriate Moldex respirators in conjunction with a comprehensive respiratory protection program, including but not limited to fit testing, may reduce, but will not eliminate, risk of infection.

- Be sure to read the Limitations outlined below and strictly follow all Warnings set forth under the WARNINGS FOR ALL USERS.
- When using any Moldex respirator, filter replacement and/or disposal must be handled in accordance with your Healthcare Facility's comprehensive respiratory protection program.
- If disinfectants are used to sanitize reusable facepieces, you must consult with your Healthcare Facility and run tests to ensure the compatibility of any disinfectant with Moldex reusable facepiece materials. Use of disinfectants could impair the efficiency of the respirator and result in a loss of protection.

LIMITATIONS

- **Respirators may reduce but do not eliminate wearer exposure to airborne hazards or the risk of contracting any disease or infection.** Only use this respirator as part of a comprehensive respiratory protection program. You will receive no respiratory protection if this respirator is not properly fitted and worn. Additionally, potentially hazardous particles, including infectious agents, smaller than the particle sizes used in NIOSH certifications are likely to exist in certain environments. Some published data indicates that these smaller particles may not be filtered out as effectively as the particle sizes used by NIOSH [N Series Count Median Diameter (CMD) $0.075 \pm .02\mu\text{m}$ Geometric Standard Deviation 1.86 (GSD) and R & P Series CMD $0.185 \pm .02\mu\text{m}$ 1.6 (GSD)] when certifying respirators. It is imperative that you determine the size and potential hazards of the particles that may be present in the environment before selecting appropriate respiratory protection, and that you refer to CDC guidelines when selecting and using any respirator, particularly in environments where smaller types of particles, such as those referenced above, may be present.
- If the respirator comes in contact with blood or fluids, including body fluids, leave contaminated area as soon as possible and discard and replace the respirator.
- Moldex respirators must **not** be used on children.

For further information on use of respirators contact Moldex at +1 (800) 421-0668 or +1 (310) 837-6500 ext. 512, your Employer, or CDC at www.cdc.gov or +1 (800) 232-4636.