

WHITEPAPER ON APR RESPIRATORY PROTECTION

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THE CRUCIAL ROLE OF AIR PURIFYING RESPIRATORS (APRS) IN WORKPLACE SAFETY

Respiratory protection is a critical component of workplace safety, helping to ensure that workers are shielded from hazardous airborne contaminants. This whitepaper delves into the importance of respiratory protection, particularly focusing on Air Purifying Respirators (APRs). We will explore the various aspects of APRs, including their configurations, effectiveness, and the guidelines for implementing a robust respiratory protection program. Additionally, we will highlight North's® APR products and their benefits.

WHY RESPIRATORY PROTECTION MATTERS

Respiratory protection is essential in environments where workers are exposed to harmful dust, fumes, vapors, or gases. Inhalation of these contaminants can lead to respiratory diseases, chronic health conditions, or even immediate life-threatening situations. Ensuring adequate respiratory protection helps mitigate these risks, safeguarding worker health and productivity.

In March 2024, the European Union¹ published in the Official Journal of the EU stricter exposure limits for hazardous substances like lead and diisocyanates. These measures aim to prevent health issues, including occupational asthma and other respiratory diseases, benefiting approximately 4.2 million workers exposed to diisocyanates.

Studies show that proper respirator use can significantly reduce the risk of respiratory illnesses and even prevent deaths by filtering out hazardous particles that could otherwise be inhaled, particularly in industries like construction, manufacturing, mining, and agriculture where exposure to airborne contaminants is prevalent.

OCCUPATIONAL RESPIRATORY ILLNESS STATISTICS

- According to the latest statistics published by the European Environment Agency in November 2024, approximately 15%² of adult asthma cases in Europe are linked to occupational exposures. Work-related factors are also responsible for about one in seven severe asthma exacerbations.
- Occupational exposures account for around 10%³ of all chronic respiratory deaths in the EU. The burden is notably higher among men, potentially due to occupational differences and underdiagnosis in women.
- Workers in agriculture, food processing, and textiles are at risk of diseases such as farmers' lung, byssinosis, and baker's asthma, caused by exposure to organic dusts and biological agents⁴. Between 2013 and 2021, 33,712 cases of occupational cancer were recognized in the EU, with lung cancer and mesothelioma accounting for about 80% of these cases⁵. Notably, 88% of occupational lung cancers are asbestos-related⁶.

¹New rules to improve protection of workers with stricter exposure limits for lead and diisocyanates
European Commission

²Occupational exposure and respiratory disease | European Environment Agency's home page

³Occupational exposure and respiratory disease | European Environment Agency's home page

⁴Occupational exposure and respiratory disease | European Environment Agency's home page

⁵33 712 cases of occupational cancer have been recognised in the EU between 2013 and 2021
| Safety and health at work EU-OSHA

⁶IMMC.COM%282022%29488%20final.ENG.xhtml.1_EN_ACT_part1_v6.docx



KEY POINTS ABOUT AIR-PURIFYING RESPIRATORS

Reduced respiratory disease risk

Studies demonstrate a substantial decrease in respiratory illnesses such as silicosis, asthma, and chronic obstructive pulmonary disease when workers consistently wear appropriate air-purifying respirators in high-exposure environments.

Compliance with regulations

In the EU, employers are legally required to protect workers from harmful airborne substances like dust, fumes, or chemicals. If these risks can't be fully controlled, the Framework Directive 89/391/EEC requires them to provide proper respiratory protection. The PPE Directive 89/656/EEC ensures that respirators are CE-certified, well-maintained, and matched to the

hazard. Workers must also be trained to use them correctly. For chemical exposure, the Chemical Agents Directive 98/24/EC says respirators are mandatory when limits are exceeded. If the substance is especially dangerous, like a carcinogen, the Carcinogens and Mutagens Directive 2004/37/EC sets even tougher rules: employers must first try to eliminate or reduce exposure at the source. If that's not possible, providing respiratory protection is required. In addition, the REACH Regulation (EC) 1907/2006 helps by making sure chemical hazards are clearly labeled, so employers can choose the right protection. Together, these laws help make sure every worker can breathe safely on the job.

Protection against various hazards

Air-purifying respirators can filter out a wide range of airborne contaminants including dust particles, mists, fumes, gases, and vapors, depending on the filter type selected based on the specific workplace hazards, concentration and exposure.

Impact on worker productivity

By mitigating respiratory discomfort and health risks, proper respirator use can improve worker productivity and reduce absenteeism due to respiratory illnesses.



WHAT IS AN AIR PURIFYING RESPIRATOR (APR) & WHEN TO USE IT?

An Air Purifying Respirator (APR) is a device designed to remove contaminants from the air through filtration or absorption through filter media and/or carbon that neutralizes the chemical compound. APRs are suitable for environments where the air quality is compromised by particulate matter, chemical vapors, or biological agents. The decision to use an APR depends on the presence and concentration of airborne hazards, as well as the specific requirements of the task at hand.

HOW TO DETERMINE THE LEVEL OF RESPIRATORY PROTECTION NEEDED?

Determining the appropriate level of respiratory protection involves assessing the type and concentration of contaminants in the air. The following steps can guide this process:

- Conduct a hazard assessment to identify the airborne contaminants.
- Measure the concentration of these contaminants.
- Compare the measured concentrations to national limits and European Union Occupational Exposure Limits (OEL).
- Select a respirator that offers protection levels exceeding the identified concentrations.
- Consider the duration of exposure and the tasks being performed.

IMPORTANT DATA POINTS

MILLIONS OF WORKERS AT RISK:

Millions of workers in the EU are exposed to hazardous substances daily. Notably, between 4.1 and 7.3 million workers are in contact with asbestos, a notorious carcinogen, and their number is expected to increase by 4% a year for the next 10 years⁷. Furthermore, around 1 million individuals face exposure to benzene, another substance known for its carcinogenic properties⁸. Additionally, approximately 900,000 workers are potentially exposed to chromium VI compounds, which are linked to serious respiratory diseases and cancer⁹.

HIGH-RISK INDUSTRIES:

Construction, mining, manufacturing, agriculture, and healthcare are among the industries with the highest need for respiratory use due to high exposure levels to airborne hazards.

FIT TESTING IMPORTANCE:

Improper fit can significantly reduce the effectiveness of a respirator, emphasizing the need for regular fit testing to ensure optimal protection.

USER TRAINING AND COMPLIANCE:

Effective respirator programs require comprehensive training on proper selection, use, maintenance, and limitations of respirators to ensure worker compliance.

WORKPLACE HAZARD ASSESSMENT:

Employers must conduct thorough assessments to identify potential airborne contaminants and select the appropriate respirator type for the specific workplace hazards.



EUROPEAN OCCUPATIONAL EXPOSURE LIMITS

In the EU, there are clear rules to protect workers from breathing in harmful substances like dust, fumes, or chemical vapors. These rules include Occupational Exposure Limits (OELs), which set the maximum amount of a substance allowed in the air we breathe at work. Some of these limits are set across the EU, while others are defined by each country. If levels go above these limits, employers must act - whether that means improving ventilation or providing the right kind of respirators. These limits aren't just numbers on paper - they're part of important laws like the Chemical Agents Directive and the Carcinogens and Mutagens Directive, which make sure that workers aren't exposed to long-term health risks. Employers must regularly check the air quality in the workplace, provide the right protection, and train employees on how to use it.

COSTS OF NON-COMPLIANCE

Non-compliance with Occupational Exposure Limits (OELs) in the European Union (EU) can lead to substantial financial penalties, varying by country and the severity of the violation. While the EU sets overarching directives, such as the Chemical Agents Directive (98/24/EC) and the Carcinogens and Mutagens Directive (2004/37/EC), enforcement and specific penalties are determined

by individual Member States. These directives mandate employers to assess risks and implement preventive measures, including adhering to established OELs.

Beyond financial repercussions, non-compliance can harm a company's reputation and lead to increased scrutiny from regulatory bodies. Employers are encouraged to stay informed about both EU directives and their national regulations to ensure a safe working environment and avoid penalties.

WHY CHOOSE APR FOR YOUR RESPIRATORY SOLUTION?

Choosing APRs for respiratory protection offers several advantages:

- **Versatility:** APRs can be equipped with different filters or cartridges to tackle a wide range of contaminants.
- **Cost-effectiveness:** APRs are generally more affordable compared to supplied-air respirators (SARs).
- **Portability:** APRs are lightweight and easy to carry, making them ideal for mobile tasks.
- **Ease of use:** APRs are simple to don and doff, requiring minimal training.

These benefits make APRs a preferred choice for many industries requiring reliable and adaptable respiratory protection.

NORTH® APR PRODUCTS

North® offers a comprehensive range of APR products designed to meet diverse respiratory protection needs. Some notable products include:



HM7700 mask is made from 100% premium-grade silicone which is soft, durable and hypoallergenic and offers a high level of protection against particulates, gases, vapors and biological agents.



Panoramasque full facepiece is designed to offer unparalleled safety and comfort. Its broad and flexible body ensures an optimal seal, providing maximum protection against harmful substances.



ESTABLISHING AN EFFECTIVE RESPIRATORY PROTECTION PROGRAM

Implementing a comprehensive respiratory protection program involves several key components:

- **Hazard Assessment:** Identify and evaluate airborne hazards in the workplace.
- **Selection of Respirators:** Choose appropriate APRs based on the type and concentration of contaminants.
- **Training and Fit Testing:** Ensure employees are trained in the proper use, maintenance, and limitations of APRs. Conduct fit testing to ensure a secure and effective seal.
- **Maintenance and Storage:** Establish procedures for the cleaning, inspection, and storage of APRs to maintain their effectiveness.
- **Program Evaluation:** Regularly review and update the respiratory protection program to address new hazards and improve safety measures.

CONCLUSION

Air Purifying Respirators (APRs) play a critical role in providing respiratory protection across various industries. Understanding their functions, configurations, and proper use is essential for ensuring worker safety.

By implementing an effective respiratory protection program and selecting the right APRs, employers can help mitigate risks and create a healthier work environment. North® APR products offer reliable and versatile solutions to meet the diverse needs of respiratory protection, helping to ensure the safety and well-being of workers.



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