

Air-Purifying Respirator Types & Protection Levels

Recommended by CDC or ECDC for COVID-19



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By now most people are familiar with the disposable half-mask respirators commonly called “N95s” or “FFP2” in the healthcare setting. But a much broader array of respiratory products are available that meet United States Centers for Disease Control and Prevention (CDC) and European Centre for Disease Prevention and Control (ECDC) guidance for protection against COVID-19.

The CDC has specified that reusable National Institute for Occupational Safety and Health (NIOSH)-approved elastomeric respirators are a viable option for use by healthcare workers and the first responder community. This document outlines MSA Safety’s NIOSH- and EN-approved respirators and filter configurations that meet CDC and ECDC’s guidance.

Two key considerations when selecting an air-purifying respirator (APR) for protection against COVID-19 are respirator type and protection level. While there are many types of respiratory protection, CDC recommends NIOSH-approved masks with a protection factor of N95 or higher and ECDC recommends EN-approved masks with a protection factor of FFP2 or higher for certain healthcare workers who may be exposed to COVID-19. Below you will find a comparison of respirator types, including supplied-air respirators; filter classifications regulated by NIOSH (that meet CDC recommendations) or EN (that meet ECDC recommendations); and in Table 1, a detailed comparison of all respirator types, including supplied-air respirators.

Types of Respirators



Half Mask, Reusable

An elastomeric, reusable mask that covers nose and mouth. The mask includes an inlet receptacle(s) for particulate filters and a one-way exhalation valve. The filters are disposable. The reusable mask can be disinfected.

Filter Classifications: All; N95 or P2 and P100 or P3 most common



Full Facepiece, Reusable

An elastomeric, reusable mask that covers eyes, nose, and mouth. The mask includes an inlet receptacle(s) for particulate filters and a one-way exhalation valve. The filters are disposable. The reusable mask can be disinfected.

Filter Classifications: All; N95 or P2 and P100 or P3 most common



Powered Air-Purifying Respirator (PAPR), Mask-Mounted - NIOSH ONLY

An elastomeric, reusable mask that covers eyes, nose and mouth. The mask includes an inlet receptacle for a motor/blower with attached particulate filter and a one-way exhalation valve. The motor/blower actively draws air through the particulate filter and delivers breathable air to the respirator inlet. The motor blower is typically powered by a belt-mounted battery. The filters are disposable. The reusable mask/PAPR assembly can be disinfected.

Filter Classifications: All; HEPA/Type HE (similar particulate efficiency to P100)



Powered Air-Purifying Respirator (PAPR), Belt-Mounted

A belt-mounted, battery-powered motor/blower that provides filtered air to a full facepiece or hood. The filters are disposable. The reusable mask/PAPR assembly can be disinfected.

Filter Classifications: All; HEPA/Type HE (similar particulate efficiency to P100)

Filter Classifications

EN143:2000	Maximum Allowed Penetration	
Filtering Class	Solid particles (NaCl)	Liquid particles (Paraffin oil)
FFP1 NR D	20%	20%
FFP2 NR D	6%	6%
FFP3 NR D	1%	1%

Term	Definition
NR	Non Reusable — filter classified as single shift use only
R	Reusable — filter intended to be used for more than a single shift
D	Dolomite dust tested (clogging in high dust environment)
P1	80% efficient against 0.3 micron (most penetrating particle size)
P2	94% efficient against 0.3 micron (most penetrating particle size)
P3	99.95% efficient against 0.3 micron (most penetrating particle size)

WE KNOW WHAT'S AT STAKE.

Filter Replacement Guidance for Reusable Respiratory Protection

Disposable filters for use in reusable respiratory protection should be discarded and replaced at least daily or more frequently as circumstances warrant according to CDC guidance. CDC and ECDC guidance on COVID-19 is rapidly evolving. Always consult the CDC and/or ECDC website for the latest recommendations.

Table 1: Comparative Analysis of Various Forms of Respiratory Protection Provided by MSA Safety

Respirator Type	Elastomeric Half-Mask Respirator		Full-Facepiece Respirator		Powered Air-Purifying Respirator, Tight-Fitting Facepiece	Powered Air-Purifying Respirator, Loose-Fitting Hood	Self-Contained Breathing Apparatus	
	NIOSH	EN	NIOSH	EN	NIOSH	NIOSH	NIOSH	EN
RESPIRATOR NAME	<ul style="list-style-type: none"> Advantage® 420 Advantage 200LS Comfo® Classic 	<ul style="list-style-type: none"> Advantage 420 Advantage 200LS Advantage 410 	<ul style="list-style-type: none"> Advantage 1000 Advantage 3200 Advantage 4100 Advantage 4200 Ultra-Elite Ultra-Twin/ Ultravue Millennium G1 Mask with APR Adapter 	<ul style="list-style-type: none"> Advantage 3100 Advantage 3200 3S 3S Basic Plus G1 Mask with APR Adapter 	<ul style="list-style-type: none"> OptimAir Mask- Mounted Optimair TL Tight- Fitting Facepiece Responder PAPR 	<ul style="list-style-type: none"> OptimAir TL 	<ul style="list-style-type: none"> G1 SCBA G1 Industrial 	<ul style="list-style-type: none"> M1 SCBA AirGo SCBA AirMaXX SCBA G1 SCBA
COMPATIBLE PARTICULATE FILTER TYPES	<ul style="list-style-type: none"> N95 Flexi Filter or prefilter with chemical cartridge R95 Flexi Filter or prefilter with chemical cartridge P100 	<ul style="list-style-type: none"> Particle filter P3 PlexTec Twin bayonet P3 cartridge Twin bayonet P3 with chemical cartridge 	<ul style="list-style-type: none"> N95 Flexi Filter or prefilter with chemical cartridge R95 Flexi Filter or prefilter with chemical cartridge P100 Riot control CBRN 	<ul style="list-style-type: none"> Particle filter P3 PlexTec Combined filter (P2+ gas filter) Combined filter (P3 + gas filter) connection Twin bayonet P3 cartridge Twin bayonet P3 with chemical cartridge 	<ul style="list-style-type: none"> HEPA CBRN for Responder PAPR 	<ul style="list-style-type: none"> HEPA 	<ul style="list-style-type: none"> Supplied Air 	<ul style="list-style-type: none"> Supplied Air
MEETS CDC GUIDANCE FOR COVID-19	✓	✓	✓	✓	✓	✓	✓	✓
Type and Scope of Protection Provided								
DISPOSABLE VS. REUSABLE	Reusable after disinfection, and replacement of filtering element		Reusable after disinfection, and replacement of filtering element		Reusable after disinfection, and replacement of filtering element	Reusable after disinfection, and replacement of filtering element	Reusable after disinfection	
ORGANS PROTECTED	<ul style="list-style-type: none"> Respiratory 		<ul style="list-style-type: none"> Respiratory Eye Face 		<ul style="list-style-type: none"> Respiratory Eye Face 	<ul style="list-style-type: none"> Respiratory Eye Face 	<ul style="list-style-type: none"> Respiratory Eye Face 	
COMPATIBLE WITH OTHER FORMS OF PPE	Yes		Yes		Yes	Yes	Yes	
DURATION OF USE	Dependent upon use conditions		Dependent upon use conditions		Dependent upon use conditions	Dependent upon use conditions	Dependent upon use conditions	
LEVEL OF TRAINING REQUIRED FOR PROPER USE	Moderate		Moderate		High	High	Highest	

Table 1: Comparative Analysis of Various Forms of Respiratory Protection Provided by MSA Safety

Continued

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	NIOSH	EN	NIOSH	EN	NIOSH		NIOSH		NIOSH	EN
RESPIRATOR NAME	<ul style="list-style-type: none">Advantage 420Advantage 200LSComfo® Classic	<ul style="list-style-type: none">Advantage 420Advantage 200LSAdvantage 410	<ul style="list-style-type: none">Advantage 1000Advantage 3200Advantage 4100Advantage 4200Ultra-EliteUltra-Twin/ UltravueMillenniumG1 Mask with APR Adapter	<ul style="list-style-type: none">Advantage 3100Advantage 32003S3S Basic PlusG1 Mask with APR Adapter	<ul style="list-style-type: none">OptimAir Mask- MountedOptimair TL Tight- Fitting FacepieceResponder PAPR		OptimAir TL		<ul style="list-style-type: none">G1 SCBAG1 Industrial	<ul style="list-style-type: none">M1 SCBAAirGo SCBAAirMaXX SCBAG1 SCBA
COMPATIBLE PARTICULATE FILTER TYPES	<ul style="list-style-type: none">N95 Flexi Filter or prefilter with chemical cartridgeR95 Flexi Filter or prefilter with chemical cartridgeP100	<ul style="list-style-type: none">Particle filter P3 PlexTecTwin bayonet P3 cartridgeTwin bayonet P3 with chemical cartridge	<ul style="list-style-type: none">N95 Flexi Filter or prefilter with chemical cartridgeR95 Flexi Filter or prefilter with chemical cartridgeP100Riot controlCBRN	<ul style="list-style-type: none">Particle filter P3 PlexTecCombined filter (P2+ gas filter)Combined filter (P3 + gas filter) connectionTwin bayonet P3 cartridgeTwin bayonet P3 with chemical cartridge	<ul style="list-style-type: none">HEPACBRN for Responder PAPR		HEPA		Supplied Air	Supplied Air
MEETS CDC GUIDANCE FOR COVID-19	✓	✓	✓	✓	✓		✓		✓	✓
Government Certification and Performance										
GOVERNMENT CERTIFICATION(S)	NIOSH 42 CFR Part 84	EN 140	NIOSH 42 CFR Part 84	EN 136	NIOSH 42 CFR Part 84	EN 12942	NIOSH 42 CFR Part 84	EN 12941	NIOSH 42 CFR Part 84, NFPA 1918 (2018) for structural firefighting applications	EN 137
BREATHING RESISTANCE	Moderate		Moderate		Low		Low		Supplied air	
ADAPTABLE TO A RANGE OF ADULT FACE SIZES	<ul style="list-style-type: none">SmallMediumLarge		<ul style="list-style-type: none">SmallMediumLarge		Adaptable to a range of adult face sizes		Adaptable to a range of adult face sizes		Adaptable to a range of adult face sizes	
ASSIGNED PROTECTION FACTOR (OSHA)	10		50		1000		1000 SWPF Available		10,000	
FIT TESTING REQUIRED	Yes		Yes		Yes		N/A		Yes	

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Continued

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	NIOSH	EN	NIOSH	EN	NIOSH	NIOSH	NIOSH	EN
RESPIRATOR NAME	<ul style="list-style-type: none"> Advantage® 420 Advantage 200LS Comfo® Classic 	<ul style="list-style-type: none"> Advantage 420 Advantage 200LS Advantage 410 	<ul style="list-style-type: none"> Advantage 1000 Advantage 3200 Advantage 4100 Advantage 4200 Ultra-Elite Ultra-Twin/Ultravue Millennium G1 Mask with APR Adapter 	<ul style="list-style-type: none"> Advantage 3100 Advantage 3200 3S 3S Basic Plus G1 Mask with APR Adapter 	<ul style="list-style-type: none"> OptimAir Mask- Mounted Optimair TL Tight- Fitting Facepiece Responder PAPR 	<ul style="list-style-type: none"> OptimAir TL 	<ul style="list-style-type: none"> G1 SCBA G1 Industrial 	<ul style="list-style-type: none"> M1 SCBA AirGo SCBA AirMaXX SCBA G1 SCBA
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MEETS CDC GUIDANCE FOR COVID-19	✓	✓	✓	✓	✓	✓	✓	✓
Design Related Characteristics and Attributes								
COMPOSITION	Synthetic, metallic, and natural materials		Synthetic, metallic, and natural materials		Synthetic, metallic, and natural materials	Synthetic, metallic, and natural materials	Synthetic, metallic, and natural materials	
EXTERNAL FORMS OF POWER REQUIRED	No		No		Yes, battery	Yes, battery	Yes, cylinder of breathable air, battery on some models	
COST	Moderate		Moderate		High	High	Highest	

Please Note

Personal protective equipment (PPE) provides limited protection and may help to reduce exposure to biological agents and the risk of viral infection but **IMPORTANTLY IT DOES NOT ELIMINATE** the risk of exposure, infection, illness, or death, including with respect to SARS-CoV-2/COVID-19. MSA relies on the expertise and recommendations of CDC, ECDC, and other cited authorities, and MSA does not warrant the efficacy of any of its PPE products, or of the information or products in this Brief, in preventing the spread and/or contraction of coronaviruses. It is your responsibility to determine what PPE is suitable for your intended use and consistent with guidelines from your employer and the relevant health authorities. MSA disclaims liability for any loss or damage arising from any information contained herein, whether direct, indirect, special, incidental or consequential, regardless of the legal or equitable theory asserted, including warranty, contract, negligence or strict liability.

Please note the situation with COVID-19 is rapidly evolving. Organizations like the CDC are providing updated information and guidance as it becomes available.

For the most-up-to date information on COVID-19, you should regularly consult guidance being published by national and international organizations, such as the CDC, the National Institutes of Health (NIH), the World Health Organization (WHO), the European Centre for Disease Prevention and Control (ECDC), and/or your local health authority. Guidance on COVID-19, including information on actions needed to prevent, control, and manage contact with the virus, is available at the following websites:

US CDC	https://www.cdc.gov/coronavirus/index.html https://www.cdc.gov/coronavirus/2019-ncov/infection-control/control-recommendations.html?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Fcoronavirus%2F2019-ncov%2Fhcp%2Finfection-control.html
US NIH	https://www.nih.gov/news-events/news-releases/nih-officials-discuss-novel-coronavirus-recently-emerged-china
WHO	https://www.who.int/health-topics/coronavirus
ECDC	https://www.ecdc.europa.eu/en/coronavirus

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