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3M™ VFlex™ Particulate Respirator Series

Technical Data Sheet

Description

The 3M™ VFlex™ Particulate Respirator Series meets the requirements of European Standard EN149:2001 + A1:2009, filtering facepiece respirators for use against particles. They provide effective respiratory protection for use in industries where workers will be exposed to solid (dust) particles and/or non-volatile liquid particles.

Sizing

3M™ VFlex™ Particulate Respirators are available in two sizes:

- VFlex™ regular
- VFlex™ small.



Select most appropriate size from the 2 sizes of respirator available. Regular sized respirator is suggested for the majority of users. Small (S) sized respirator is suggested for users with small faces. The small sized respirator is denoted by the inclusion of an “S” in the model number.

Applications

These respirators are suitable for use in concentrations of solid (dust) particles and/or non-volatile liquid particles up to the following limits:

Product	EN 149:2001+A1:2009 Classification	Nominal Protection Factor (NPF)*
VFlex™ 9101E/9101ES	FFP1 NR D	4
VFlex™ 9161E/9161ES		
VFlex™ 9152E/9152ES	FFP2 NR D	12
VFlex™ 9162E/9162ES		
VFlex™ 9163E/9163ES	FFP3 NR D	50

*Many countries apply Assigned Protection Factors (APFs) which reduce the maximum concentrations of particles in which these products can be used. See national regulations and EN 529:2005.

Product	Typical Weight	Valved / Unvalved
 3M™ VFlex™ 9101E/9101ES	11g	Unvalved
 3M™ VFlex™ 9152E/9152ES	11g	Unvalved
3M™ VFlex™ 9161E/9161ES	15g	Valved
3M™ VFlex™ 9162E/9162ES	15g	Valved
3M™ VFlex™ 9163E/9163ES	15g	Valved

Respiratory protection is only effective if it is correctly selected, fitted and worn throughout the time when the wearer is exposed to hazards.

Products are classified by filtering efficiency and maximum total inward leakage performance (FFP1, FFP2 and FFP3), also by usability and clogging resistance.

Performance tests in this standard include filter penetration; extended exposure (loading) test; flammability; breathing resistance and total inward leakage. Reusable products are also subjected to cleaning, storage and mandatory clogging resistance tests (clogging is optional for non-reusable products). A full copy of EN 149:2001+A1:2009 can be purchased from your national standards body.

Filter Penetration

The filter penetration, initial and after 120mg of loading with both 120mg of NaCl* and Paraffin Oil, shall not exceed the following limits:

EN 149:2001+A1:2009 Classification	Maximum Filter Penetration
FFP1	20%
FFP2	6%
FFP3	1%

*Loading of NaCl may be stopped if filter penetration during loading is observed to decrease

3M™ VFlex™ Particulate Respirators

Total Inwards Leakage

Ten subjects perform five test exercises whilst wearing the respirator. The total inward leakage inside of the respirator due to face seal leakage, filter penetration and valve leakage is measured for each subject exercise. The subject mean total inward leakage for 8 out of 10 subjects shall not exceed the following limits:

EN 149:2001+A1:2009 Classification	Maximum Filter Penetration
FFP1	22%
FFP2	8%
FFP3	2%

Breathing Resistance

The breathing resistance of the respirator is tested during inhalation (continuous flow) and exhalation (cyclical flow). The breathing resistance of the respirators shall not exceed the following limits:

EN 149:2001+A1:2009 Classification	Maximum Breathing Resistance		
	Inhalation at 30l/min	Inhalation at 95l/min	Inhalation at 160l/min
FFP1	0.6 mbar	2.1 mbar	3.0 mbar
FFP2	0.7 mbar	2.4 mbar	3.0 mbar
FFP3	1.0 mbar	3.0 mbar	3.0 mbar

Clogging

For single shift use respirators (NR), the clogging test is optional. For re-usable respirators (R) this test is mandatory. The respirators are loaded with very high amount of Dolomite dust which will tend to clog the filter. After loading with the required amount of dust, the breathing resistance of the respirators shall not exceed the following limits:

EN 149:2001+A1:2009 Classification	Maximum Breathing Resistance	
	Inhalation at 95l/min	Exhalation at 160l/min (continuous flow)
FFP1	4.0 mbar (valved respirator)	3.0 mbar (valved respirator)
	3.0 mbar (unvalved respirator)	
FFP2	5.0 mbar (valved respirator)	3.0 mbar (valved respirator)
	4.0 mbar (unvalved respirator)	
FFP3	7.0 mbar (valved respirator)	3.0 mbar (valved respirator)
	5.0 mbar (unvalved respirator)	

Flammability

Tested respirators are mounted on a metallic head which rotates with a linear speed of 60mm/s. The respirators are passed within 20mm of the tip of an 800°C (±50°C) propane burner flame. The respirator shall not burn or continue to burn within 5 seconds of removal from the flame.

Components and materials

The following materials are used in the production of the 3M™ Particulate Respirators VFlex Series:

Component	Material
Straps	Polyisoprene
Staples	Steel
Nose Clip	Aluminium
Filter	Polypropylene
Exhalation Valve	Polypropylene / Polyisoprene

These products do not contain components made from natural rubber latex.

Storage and Transportation

3M™ VFlex™ Particulate Respirators have a shelf life of 5 years from date of manufacture. End of shelf life is marked on the product packaging and upon the product. Before initial use, always check that the product is within the stated shelf life (use by date). Product should be stored in clean, dry conditions within the temperature range: - 20°C to + 25°C with a maximum relative humidity of <80%. When storing or transporting this product use original packaging provided.

Warnings and Limitations

Always be sure that the complete product is:

- Suitable for the application;
- Fitted correctly;
- Worn during all periods of exposure;
- Replaced when necessary.
- Proper selection, training, use and appropriate maintenance are essential in order for the product to help protect the wearer from certain airborne contaminants.
- Failure to follow all instructions on the use of these respiratory protection products and/or failure to properly wear the complete product during all periods of exposure may adversely affect the wearer's health, lead to severe or life threatening illness or permanent disability.
- For suitability and proper use follow local regulations and refer to all information supplied. For more information contact a safety professional/3M representative.
- Before use, the wearer must be trained in use of the complete product in accordance with applicable Health and Safety standards/guidance.
- These products do not contain components made from natural rubber latex.
- These products do not protect against gases/vapours.
- Do not use in atmospheres containing less than 19.5% oxygen. Individual countries may apply their own limits on oxygen deficiency. Seek advice if in doubt).
- Do not use for respiratory protection against atmospheric contaminants/concentrations which are unknown or immediately dangerous to life and health (IDLH).