

Respiratory Protection – Standards, Risk Assessment & Guidance

The design, materials and performance of respiratory protective equipment (RPE) have advanced significantly in recent years. To select the correct respiratory protection, a risk assessment should first be carried out so that the selected equipment is suitable for the specific hazards present in the working environment. MJ Scannell Safety | RG Ireland has access to a wide range of professional respiratory protection solutions. This document illustrates the current European standards and protection levels available for respiratory protective equipment.

Risk Assessment

Risk assessment involves defining the work area, identifying airborne hazards and selecting suitable respiratory protection to minimise exposure. Airborne hazards may include dusts, fumes, mists, gases, vapours and biological contaminants.

The protective features of modern respiratory protection may include particulate filtration, gas and vapour filtration, powered air purification, reusable half masks, full face respirators, disposable filtering masks, and supplied air systems.

Selection should consider:

- Type and concentration of contaminant
- Exposure duration
- Workplace oxygen levels
- Required protection factor
- Comfort and compatibility with other PPE

Correct selection ensures that workers are adequately protected while maintaining comfort and productivity.

Care and Maintenance

Respiratory protective equipment should be inspected regularly to ensure it remains in safe working condition.

Reusable respirators should be cleaned and disinfected according to the manufacturer's instructions after use. Do not use solvents or harsh chemicals that may damage components.

Where respirators become contaminated, damaged or excessively worn, they should be replaced immediately. Filters and cartridges must be changed according to usage levels, workplace conditions and manufacturer guidance.

Proper storage in a clean, dry environment away from direct sunlight, chemicals and contaminants will help maintain equipment performance and service life.

Respiratory Protection Standards (European PPE)

Professional Use	Standard	Description
Filtering Half Masks (Disposable Respirators)	EN 149:2001 + A1:2009	• Protect against solid and liquid aerosols • Classified as FFP1, FFP2 and FFP3 according to filtration efficiency and leakage limits
Reusable Half Masks & Full Face Masks	EN 140 / EN 136	• EN 140 applies to reusable half masks • EN 136 applies to full face respirators providing eye and face protection
Particle Filters	EN 143:2021	• Filters used with reusable respirators for protection against airborne
Gas and Vapour Filters	EN 14387:2021	• Filters designed to protect against specific gases and vapours

		depending on filter type
Powered Air Respirators (PAPR)	EN 12941 / EN 12942	Powered systems supplying filtered air to a hood, helmet or facepiece
Supplied Air Respirators	EN 14593 / EN 14594	Systems delivering breathable air from an external source

Filtering Facepiece Respirators– EN 149.

Filtering half masks (commonly referred to as disposable respirators) protect against dust, mist and aerosols. They are classified by filtration efficiency and inward leakage performance.

Class	Minimum Filtration Efficiency	Typical Applications
FFP1	≥ 80%	Low levels of dust, non-toxic particles
S1	≥ 94%	Moderate levels of dust, mist and fumes
S1P	≥ 99%	Fine toxic dusts, fumes and hazardous particles

FFP respirators may also include exhalation valves to improve breathing comfort and reduce heat build-up inside the mask.

Particle Filters – EN 143

Particle filters used with reusable respirators are classified according to filtration efficiency.

Class	Protection Level
P1	Low efficiency particle filtration
P2	Medium efficiency particle filtration
P3	High efficiency particle filtration

P3 filters provide the highest level of particle protection and are typically used in environments with hazardous dust or fine particulates.

Gas and Vapour Filter Types – EN 14387

Gas and vapour filters are identified by colour codes that indicate the type of contaminant they protect against.

Filter Type	Colour	Protects Against	Examples	Important Notes
A	Brown	Organic vapours (boiling point > 65°C)	Paints, solvents, white spirit, adhesives	Most common filter for industrial use
AX	Brown	Organic vapours (boiling point < 65°C)	Acetone, methanol, very volatile solvents	Single-use only – cannot be reused
B	Grey	Inorganic gases and vapours	Chlorine, hydrogen sulphide	Does NOT protect against organic vapours
E	Yellow	Acid gases	Sulphur dioxide, hydrogen chloride	Used in chemical and industrial processes
K	Green	Ammonia and derivatives	Ammonia gas, cleaning chemicals	Common in agriculture & refrigeration
Hg	Red	Mercury vapours	Mercury exposure environments	Limited use time (strict control required)
NO	Blue	Nitrogen oxides	Nitric oxide, nitrogen dioxide	Specialist industrial applications
CO	Black	Carbon monoxide	Fire/rescue only	Very specialised – not general use

Combination filters may protect against multiple contaminants.

Protection Factors (Guidance)

Assigned protection factors indicate the level of protection expected from correctly fitted respiratory equipment.

Respirator Type	APF	Air Outside Mask	Air Inside Mask	Reduction Level
FFP1	4	100 units	25 units	Low protection
FFP2	10	100 units	10 units	Medium protection
FFP3	20	100 units	5 units	High protection
Half Mask + P3	20	100 units	5 units	High protection
Full Face Mask + P3	40	100 units	2.5 units	Very high protection
Powered Respirator	40+	100 units	≤2.5 units	Highest protection

Correct fit and seal are essential to achieve these protection levels.

Choosing Correct Respiratory Protection

When selecting respiratory protection, consider:

- Type of airborne contaminant (dust, gas, vapour or biological hazard)
- Concentration levels in the workplace
- Duration of exposure
- Comfort and compatibility with other PPE such as eye protection or helmets
- Whether reusable or disposable equipment is more suitable

Respiratory protection should always be used as part of a wider workplace safety strategy including ventilation, containment and safe working practices.