

Masks Against Coronavirus

A mask can be either a disposable medical device (a “surgical” type mask) or personal protective equipment (a “respirator”), worn by caregivers and/or contagious patients. Depending on the type of mask, it protects against the transmission of infectious agents by “droplet” or “airborne” routes. Depending on the standard it meets and its protection class, it can prevent contamination by viruses such as [coronavirus](#), SARS and H1N1.

- **Disposable or reusable:** Surgical masks are only available as disposable. Respirators can be reusable. In the case of respirators, it is possible to replace the filter once it is full.
- **Effective life:** the duration of a mask's effectiveness varies according to use. It can be between three and eight hours. A cheaper mask can mean a short period of use. This is systematically indicated by the manufacturer.

Type of mask

The two main types of masks are -

1. Surgical

- EN 14683: Type 1, Type 2, Type R
- ASTM: Level 1 / 2 / 3

2. Respirators.

- EN 149: FFP1, FFP2, FFP3
- NIOSH: Class N, Class R, Class P

Surgical masks



European standard EN 14683. According to this standard there are three types of effectiveness:

- Type 1 or BFE1 with a bacterial filtration efficiency of over 95%.
- Type 2 or BFE2 with a bacterial filtration efficiency of over 98%.
- Type R: the European standard also adds a test of resistance to projection for types 1R and 2R, 2R being the most resistant.

ASTM

In the United States surgical masks must comply with ASTM standards. There are three levels of protection:

- Level 1: for a low risk of exposure to fluids.
- Level 2: for a moderate risk of exposure to fluids.
- Level 3: for a high risk of exposure to fluids.

A surgical mask will not prevent the wearer from being potentially contaminated by a virus such as the Coronavirus.

Respirators

Respirators are divided into two categories: insulating and filtering. Filtering respirators consist of a facepiece and a filtering device.

European standard EN 149: 2001. According to this standard, there are three classes of disposable particulate respirators:

FFP1: the least filtering of the three masks with an aerosol filtration of at least 80% and leakage to the inside of maximum 22%; it is mainly used as a dust mask (home renovations and various types of work).

VENUS V-2510 SL

Class: FFP1 NR D

Protection: Solid Dust / Oil Mist

M.U.L.: Upto 4 x OEL



- **FFP2:**

Minimum 94% filtration percentage and maximum 8% leakage to the inside; mainly used in construction, agriculture, the pharmaceutical industry and by healthcare professionals against influenza viruses or respiratory illnesses such as avian flu, SARS, pneumonic plague, tuberculosis and most recently the new coronavirus.

V-Shwas Comfort

Class: FFP2 S

Protection: Solid Dust / Mist

M.U.L.: Upto 12 x OE



<https://mmdsscientific.com>

- **FFP3:**

Minimum filtration percentage of 99% and maximum 2% leakage to the inside; it is the most filtering mask of the FFPs and protects against very fine particles such as asbestos.

- **ENUS V-2230 SLV**

- Class: FFP3 SLV
- Protection: Solid Dust / Oil Mist
- M.U.L.: Upto 50 x OEL
- Exhalation Vent Valve
- Full Foam Seal

Examples: see the pictures

**3M™ Aura™ Disposable Respirator 9332+,
FFP3, Valved, 120 EA/Case**



NIOSH

- In the United States, respirators must meet NIOSH (National Institute for Occupational Safety and Health) standards. Within this standard, there are several classes of respirators depending on the degree of oil resistance:

Class N:

Not oil resistance. A distinction is made between N95, N99 and N100. The number after the letter indicates the percentage of filtration of suspended particles.

NIOSH RESPIRATOR FILTER CLASSES

NIOSH classifies the filtering media in respirators based on its resistance to oil and its particle filtering efficiency. The resistance to oil is designated as "N", "R", or "P". Particle filtering efficiency is designated "95", "99", or "99.97".



NOT RESISTANT TO OIL

N95, N99, N100
Filters at least 95%, 99%, or 99.97% of airborne particles

SOMEWHAT RESISTANT TO OIL

R95, R99, R100
Filters at least 95%, 99%, or 99.97% of airborne particles

STRONGLY RESISTANT TO OIL/OIL PROOF

P95, P99, P100
Filters at least 95%, 99%, or 99.97% of airborne particles

OILS

When products containing oil (like fuel, lubricating or hydraulic oils, solvents, paints, and pesticides) are sprayed or used in processes producing aerosols or droplets, the oil component may become airborne.



Centers for Disease Control and Prevention
National Institute for Occupational Safety and Health

NIOSH Respirator Trusted-Source:
https://www.cdc.gov/niosh/npptl/topics/respirators/disp_part/RespSource.html
NIOSH Respirator Selection Logic:
<https://www.cdc.gov/niosh/docs/2005-100/pdfs/2005-100.pdf>

N95



N99



Atlanta Healthcare
Cambridge N99
Mask, Size: XS
(Black)
Breathing Life: Up
to 240 Hrs,
Washable and
Reusable, Tested
For: N99 (Nielsen
US)



N99 Anti Pollution
Mask with 4 layer
protective filters Pm
2.5 Activated Carbon
Filters (washable and
reusable)(Black)



N100



Flu-Making-Machine-
Surgical-Face-Fashion-
N100-4-Layer-Ce-
Reusable-Washable-
Face-Mask

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- Class R:

Mask resistant to oil for up to eight hours.
Here again, a distinction is made between R95, R99 and R100.

R95



**Gerson 1940 R95
Particulate Respirator
with Valve**



**Gerson 1845 R95 Particulate
Respirator with Valve and Gasket**

- Class P:

A completely oil-resistant mask. There are also P95, P99 and P100.

P95



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P100



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Coronavirus, SARS, H1N1

- For the contagious patient: it is necessary to wear the surgical mask as soon as contagion is suspected.
- For caregivers: it is necessary to wear a protective mask of at least class FFP2 or FFP3 (Class N, R or P in the United States) for maximum filtration of particles and aerosols when caring for a patient who is infected or suspected of being so.

- Reference:

- [Http://guide.medicalexpo.com/choosing-a-surgical-mask-or-respirator/](http://guide.medicalexpo.com/choosing-a-surgical-mask-or-respirator/)
- <https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/cloth-face-cover.html>

THE END.