

# What's The Difference Between N95 and KN95 Masks?



**N95**



**KN95**

With such similar sounding names, it can be confusing to understand the difference between N95 and KN95 masks. What are KN95 masks, and are they the same as N95 masks? This handy chart explains the differences between N95 and KN95 masks (and all characteristics that are the same).

In short, N95 masks are the US standards for respirator masks; KN95 masks are the Chinese standards for masks. These are the requirements that the US National Institute for Occupational Safety and Health requires manufacturers to meet in order to label their masks as N95s. Despite the long list of differences, the two masks are equivalent or nearly equivalent on the features that most people care about.

Based on this comparison, it is reasonable to consider China KN95, AS/NZ P2, Korea 1st Class, and Japan DS FFRs as "equivalent" to US NIOSH N95 and European FFP2 respirators, for filtering non-oil-based particles such as those resulting from wildfires, PM 2.5 air pollution, volcanic eruptions, or bioaerosols (e.g. viruses). However, prior to selecting a respirator, users should consult their local respiratory protection regulations and requirements or check with their local public health authorities for selection guidance.

Certification/ Class (Standard)	N95 (NIOSH-42C FR84)	FFP2 (EN 149-2001)	KN95 (GB2626-20 06)	P2 (AS/NZ 1716:2012)	Korea 1 <sup>st</sup> Class (KMOEL - 2017-64)	DS (Japan JMHLLW- Notification 214, 2018)
Filter performance – (must be ≥ X% efficient)	≥ 95%	≥ 94%	≥ 95%	≥ 94%	≥ 94%	≥ 95%
Test agent	NaCl	NaCl and paraffin oil	NaCl	NaCl	NaCl and paraffin oil	NaCl
Flow rate	85 L/min	95 L/min	85 L/min	95 L/min	95 L/min	85 L/min
Total inward leakage (TIL)* – tested on human subjects each performing exercises	N/A	≤ 8% leakage (arithmetic mean)	≤ 8% leakage (arithmetic mean)	≤ 8% leakage (individual and arithmetic mean)	≤ 8% leakage (arithmetic mean)	Inward Leakage measured and included in User Instructions
Inhalation resistance – max pressure drop	≤ 343 Pa	≤ 70 Pa (at 30 L/min) ≤ 240 Pa (at 95 L/min) ≤ 500 Pa (clogging)	≤ 350 Pa	≤ 70 Pa (at 30 L/min) ≤ 240 Pa (at 95 L/min)	≤ 70 Pa (at 30 L/min) ≤ 240 Pa (at 95 L/min)	≤ 70 Pa (w/valve) ≤ 50 Pa (no valve)
Flow rate	85 L/min	Varied – see above	85 L/min	Varied – see above	Varied – see above	40 L/min
Exhalation resistance - max pressure drop	≤ 245 Pa	≤ 300 Pa	≤ 250 Pa	≤ 120 Pa	≤ 300 Pa	≤ 70 Pa (w/valve) ≤ 50 Pa (no valve)
Flow rate	85 L/min	160 L/min	85 L/min	85 L/min	160 L/min	40 L/min
Exhalation valve leakage requirement	Leak rate ≤ 30 mL/min	N/A	Depressurizatio n to 0 Pa ≥ 20 sec	Leak rate ≤ 30 mL/min	visual inspection after 300 L/min for 30 sec	Depressurizatio n to 0 Pa ≥ 15 sec
Force applied	-245 Pa	N/A	-249 Pa	-250 Pa	N/A	-1,470 Pa
CO <sub>2</sub> clearance requirement	N/A	≤ 1%	≤ 1%	≤ 1%	≤ 1%	≤ 1%

\*Japan JMHLLW-Notification 214 requires an Inward Leakage test rather than a TIL test.

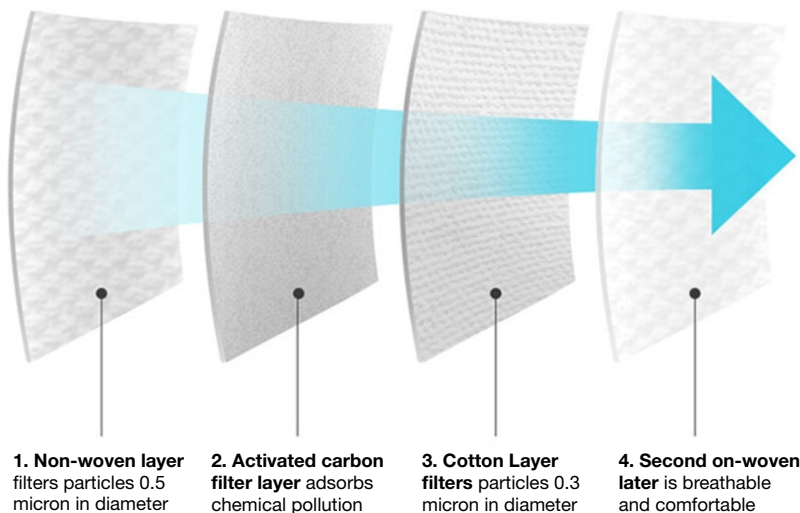
According to mask manufacturer 3M, "it is reasonable to consider" China's KN95s "equivalent" to US N95s. Mask standards for Europe (FFP2), Australia (P2), Korea (KMOEL), and Japan (DS) are also highly similar.

## N95 vs. KN95: What's The Same?

**N95 respirators** filter out most airborne particles, protecting wearers from breathing in particles down to 0.3 microns in diameter

However, the coronavirus measures 0.12 microns in diameter

Source: South China Morning Post 4/17/2020



Lots of users care most about what percentage of particles the masks capture. On this metric, N95 and KN95 respirator masks are the same. Both masks are rated to capture 95% of tiny particles (0.3 micron particles, to be exact).

Since N95 and KN95 masks are rated to capture 95% of 0.3 micron particles, people will often assume that masks can't capture particles smaller than 0.3 microns. For example, here's an infographic in the South China Morning Post claiming just this. They even go so far as to say "N95 respirators protect the wearer from breathing in particles bigger than 0.3 microns in diameter."

However, that's not true. Masks are actually more effective at capturing smaller particles than many people believe. Empirical data finds that masks are actually highly effective at capturing smaller smaller particles.

## Difference Between N95 vs. KN95 Masks

Both ratings require masks to be tested for filtration efficiency at capturing salt particles (NaCl). Both are tested at a flow rate of 85 L/minute. However, there are some differences between N95 and KN95, highlighted here.

Most of these differences are small and would be uninteresting to the average mask user. However, here are the key differences:

1. To be certified as a KN95 mask, the Chinese government requires the manufacturer to run mask fit tests on real humans with 8% leakage. The N95 mask standard does not require manufacturers to run fit tests.

This does not mean that fit tests aren't helpful. Many hospitals and companies require their workers to be fit-tested. However, those are requirements of companies themselves, not for the US NIOSH certification on the mask. Here's the full US Code of Federal Regulations for N95 (and also N99, N100 masks) with more info.

2. N95 masks have slightly stricter requirements for pressure drop while inhaling. That means they're required to be slightly more breathable than KN95 masks.

3. N95s also have slightly stricter requirements for pressure drop while exhaling, which should help with breathability.

### KN 95 vs. N95 – Differences Highlighted

Based on this comparison, it is reasonable to consider China KN95, AS/NZ P2, Korea 1st Class, and Japan DS FFRs as "equivalent" to US NIOSH N95 and European FFP2 respirators, for filtering non-oil-based particles such as those resulting from wildfires, PM 2.5 air pollution, volcanic eruptions, or bioaerosols (e.g. viruses). However, prior to selecting a respirator, users should consult their local respiratory protection regulations and requirements or check with their local public health authorities for selection guidance.

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## Bottom Line: Difference Between N95 vs. KN95 Masks

Bottom line: N95s and KN95s are both rated to capture 95% of particles, although only KN95 masks are required to pass fit tests. N95 masks have slightly stronger requirements for breathability. Breathe safe!