

WHEN SHOULD YOU CHOOSE AN ABSOLUTE OR NOMINAL FILTER?

Not all 5 micron filters are the same.
Understanding the difference helps you choose the right filter for your process, protect your equipment and control costs.



TWO FILTERS. SAME MICRON RATING. VERY DIFFERENT PERFORMANCE.



Micron rating = particle size
Efficiency = how many particles are actually removed



Know the efficiency behind the micron rating.



The right choice depends on your process, not just the smallest micron.

NOMINAL FILTER: VARIABLE EFFICIENCY

Nominal filters remove a percentage of particles at the stated micron size. Efficiency can vary significantly between products, manufacturers and test methods.

EXAMPLE: 5 MICRON NOMINAL FILTER
How many 5 μm particles are removed?

10,000 5 μm particles entering the filter

LOWER EFFICIENCY (70%)
3,000 pass through

HIGHER EFFICIENCY (99%)
100 pass through

Great for prefiltration and bulk particle removal
Cost-effective, higher dirt holding capacity, longer life
Ideal where some particle breakthrough is acceptable

ABSOLUTE FILTER: DEFINED EFFICIENCY

Absolute filters are tested to a defined removal efficiency at a specified particle size, often expressed as a Beta ratio.

EXAMPLE: 5 MICRON ABSOLUTE FILTER
Beta ratio (β₅) = 1,000 (≈ 99.9% efficiency)

10,000 5 μm particles entering the filter

β₅ = 1,000
10 pass through (99.9% removed)

Provides predictable, consistent particle retention
Ideal for final/polishing filtration and critical protection
Easier to validate and compare between suppliers

WHY IT MATTERS WHEN CHANGING SUPPLIER

EXISTING FILTER
5 μm Nominal
~80% efficiency

80% retained
20% passes through

NEW SUPPLIER FILTER
5 μm Higher Efficiency
~99% efficiency

99% retained
1% passes through

WHAT YOU MIGHT NOTICE

- Increased differential pressure
- Shorter filter life
- More frequent changeouts

BUT THE REALITY IS...

The new filter is capturing more contaminants that previously passed through. It may look like it's performing worse, but it could actually be doing its job better.

THE BETA RATIO EXPLAINED

Beta (β) = number of particles upstream divided by number of particles downstream for a given particle size.

Beta Ratio	Approx. Efficiency
β = 2	50%
β = 10	90%
β = 100	99%
β = 1,000	99.9%
β = 2,000	99.95%

ALWAYS CHECK THE TEST METHOD

Filter performance depends on how it is tested. Different test methods can produce different results.

WHEN COMPARING FILTERS, DON'T STOP AT THE MICRON RATING.

Ask for:

- ✓ Nominal or absolute?
- ✓ Removal efficiency or Beta ratio
- ✓ Test method
- ✓ Flow rate & differential pressure
- ✓ Dirt holding capacity

WHERE EACH FILTER TYPE FITS BEST

NOMINAL FILTERS

- Prefiltration / bulk particle removal
- High contaminant loading
- Longer life and higher dirt holding capacity
- Cost-effective solution

FILTRATION TRAIN EXAMPLE

Process Fluid → Strainer / Bag Filter (Coarse) → Depth Filter (Nominal) → Membrane or Cartridge (Absolute) → Process

ABSOLUTE FILTERS

- Final / polishing filtration
- Protection of critical equipment (e.g. membranes)
- Tight control of particle breakthrough
- Consistent, repeatable performance



KEY TAKEAWAY

The best filter isn't always the finest filter. It's the right filter for the right stage of your process.

Understand what you need to remove, at what efficiency, and choose based on your process — not just the micron rating.

QUICK COMPARISON		
CRITERIA	NOMINAL	ABSOLUTE
Efficiency at rated micron	Variable (e.g. 70–99%)	Defined (e.g. β ₅ = 1,000)
Predictability	Lower	Higher
Best for	Prefiltration, high loading	Final filtration, critical protection
Filter life	Often longer	May be shorter (captures more)
Cost	Generally lower	Generally higher
Supplier comparison	More difficult	Easier with Beta/efficiency data

Before comparing two “5 micron” filters, make sure you know what the 5 micron actually means.