Mesh Size vs Micron Size: Technical Whitepaper for Irrigation & Water Filtration Trades

Why Mesh vs Micron Sparks Debate

Ask ten people to define mesh and micron and you will hear twelve answers. Some contractors use the terms as if they are interchangeable; others insist that "100 mesh" and "100 micron" mean the same thing. They do not. Mesh is a count of openings in a woven screen. Micron is a unit of length. Because wire diameter, weave style, and media type all change how a filter actually behaves, the same job can be described in two very different ways, leading to confusion on job quotes, submittals, and change orders.

Purpose of This Whitepaper

This whitepaper settles the mesh-versus-micron debate for the trades. It provides clear, field-tested explanations, simple rules of thumb, and realistic examples so you can specify, install, and maintain the right filtration for irrigation systems, well water, city hookups, golf courses, and sports complexes. By the end, you will know when to use mesh, when to use microns, how to convert between them, and how to avoid costly pressure-drop and clogging issues.

Quick Visual Comparison

Use this side-by-side to align stakeholders on terminology before specifying equipment:

	Mesh Size	Micron Size
What it measures	Count of openings per inch in a woven screen (e.g., 80 mesh)	Particle size in micrometers (µm) through/blocked by a medium
Common in	Irrigation strainers, pump suction screens, disc filters (rated in mesh)	Cartridge filters, membranes, bag filters (rated in µm)
Analogy	Big garden gate keeping out rabbits	Fine water filter catching dust
Best for	Rugged, cleanable screening of larger debris and grit	Precise, consistent capture of small particles

Definitions & Useful Math

• Mesh (M): number of openings per linear inch in a woven screen. Higher M ⇒ smaller openings.

• Wire diameter (d): thickness of the screen wire. It reduces the open area and the clear opening.

• Clear opening (a): for square weave screens: $a \approx (1/M) - d$ (inches). Convert to micrometers by × 25,400.

• Percent Open Area (POA): POA ≈ $(a / (a + d))^2 \times 100$ for square weave. Higher POA → lower pressure drop.

• Micron rating (µm): nominal ratings capture a stated fraction; absolute ratings typically ≥99% at the rated size.

Field Conversions (Approximate)

Exact conversion requires wire diameter. These pairs are commonly used in irrigation as ballpark values:

Approx. Mesh	Approx. Opening (µm)	Typical Use
20 mesh	~840 µm	Coarse pump suction strainers; surface water with leaves
40 mesh	~420 µm	Sprinklers/nozzles pre-screening; general irrigation
60 mesh	~250 µm	Drip tape pre-filtration (coarse); golf lakes with algae
80 mesh	~180 µm	Spray nozzles protection; polishing after sand separators
100 mesh	~150 µm	Drip emitters protection; secondary screens

Protecting Orifices: Match Filter to the Smallest Opening

Rule of thumb: choose filter opening ≤ 1/10 of the smallest downstream orifice diameter:

Component	Typical Orifice Diameter	Recommended Filtration
Drip emitters	0.2–1.0 mm (200–1000 µm)	100–150 mesh (~150–100 µm)
Spray nozzles	0.8–1.6 mm	40–80 mesh (~420–180 µm)
Solenoid valves/pilot ports	0.5–1.0 mm	80–100 mesh (~180–150 µm) or 100 µm cartridge
Flow meters & injectors	0.3–0.6 mm	50–100 µm micron-rated cartridge

Pressure Drop (ΔP) & Sizing Considerations

Aim for clean ΔP ≤ 1–2 psi across screens and ≤ 2–3 psi across cartridges at design flow. Trigger cleaning/changeout at ΔP = 5–7 psi.

ΔP rises roughly with $velocity^2$ through the media. If ΔP is high: upsize the housing, increase screen area, lower flow per element, or stage filtration.

Contaminant Profiles by Source

Source	Likely Contaminants	Filtration Approach

Shallow wells	Sand, fines, iron bacteria	40–80 mesh screen + 100–50 µm cartridge; add sand separator if bursts occur
Deep wells	Scale, fine silt	80–100 mesh screen + 50–20 µm cartridge
Surface water (ponds/lakes)	Leaves, algae, biofilm	40–60 mesh screen; auto-flush; chemical program as needed
Municipal water	Low solids; debris spikes	60–100 mesh screen; add 25–5 µm where instruments/RO require

Staged Filtration Examples

Example A – 18-hole Golf Course Pump Station (3,000 gpm):
- Stage 1: automatic self-cleaning screens, 40 mesh.
- Stage 2: disc filter banks 100 mesh (~150 µm).
- Backflush at 6 psi ΔP or 30 minutes; clean ΔP ≤ 2 psi per stage.

Example B – Sports Complex Drip Irrigation (120 gpm zone):
- Stage 1: Y-strainer 80 mesh.
- Stage 2: 100 µm cartridge manifolds; changeout at 7 psi ΔP or 3 months.
- Flush ports at low points to purge fines.

Example C – Well Water Nursery (60 gpm):
- Stage 1: hydrocyclone sand separator (≥98% removal >100 µm).
- Stage 2: 60 mesh screen.
- Stage 3: 50 µm cartridge for fine mist nozzles.

Materials, Chemistry & Durability

304/316 stainless for strength and temperature (use 316 for chlorides); polymer housings for corrosion resistance; brass/bronze for municipal tie-ins (watch dezincification). Verify seal compatibility with chlorination/acid cleaning if used.

Mesh vs Micron:
The Ultimate Showdown 🥊

What it measures	 Mesh Size	 Micron Size
Common in	Number of openings per inch	Particle size in micrometers
Analogy	Irrigation & Agriculture	Ultra-fine filter catching dust
Best for	Big garden gate keeping out rabbits	Ultra-fine filter, catching dust
Best for	Larger particles, screens	Precise filtration, tiny particles