Glass vs. Ceramic Fuses

FCD Series
Ceramic

FSD Series
Glass

Glass and ceramic fuses both protect circuits the same way: the internal element melts during an overcurrent and opens the circuit. The real difference is what happens in the split-second after the element opens, especially during short-circuit faults (high current, high energy), where arcing and fault containment become the whole game.

OptiFuse carries both styles across common tube-fuse sizes (3.6×10mm, 5×15mm, 5×20mm, 6.3×32mm, and more).

Choose a glass fuse when fault current is low/moderate and you want easy visual inspection (clear body).

Choose a ceramic fuse when you might see higher fault current / higher energy and you need better arc-quenching and higher breaking capacity.

Glass vs. Ceramic Fuse Comparison

FEATURE	GLASS TUBE FUSE	CERAMIC TUBE FUSE
Visual inspection	Easy (transparent body)	Not visible (opaque)
Typical “why”	Convenience + adequate protection	Higher breaking capacity / safer fault containment
Best fit	Consumer electronics, low/limited fault current	Applications where higher fault current can occur
Common risk	Substituting glass where ceramic was required	Usually acceptable if ratings match.

Ceramic Fuses and Interrupt Rating

Ceramic construction is mechanically stronger and typically uses sand filling to quench arcing and raise interrupt capability.

The key specification that determines this performance is the fuse interrupt rating (breaking capacity) — a rating many people overlook until something fails violently.

Interrupt rating (breaking capacity) is the maximum fault current a fuse can safely clear at its rated voltage. It is not the same thing as the fuse's amp rating

Why it matters

When a fuse opens under a high-energy fault, an arc can form across the melted gap. If the fuse can't quench that arc, it may not clear cleanly. This can create overheating, damage, or (worst case) rupture.

A concrete OptiFuse example (same size, very different outcomes)

A lot of designers assume "5x20mm is 5x20mm." The form factor between two fuse types can be the exact same, but electrically, their ratings can differ substantially.

- **FSD (glass, fast-acting, 5×20mm):** interrupting rating listed as 35A or 10×In at 250VAC (whichever is larger).
- **FCD (ceramic, fast-acting, 5×20mm):** interrupting rating listed as 1500A @ 250VAC (and additional higher ratings shown for specific conditions/models).

What's physically different inside?

Glass tube fuses

- Transparent body helps field diagnosis
- Under high-energy faults, glass construction generally provides less robust containment than ceramic designs (depends on series design and interrupt rating).

Ceramic tube fuses

- Opaque body (diagnosis by meter)
- Ceramic is mechanically stronger
- Many ceramic fuses use sand filling to help quench arcs under short-circuit conditions, improving fault-clearing behavior.

When a glass fuse is the right call

Use a glass tube fuse when:

- You want easy visual inspection in the field.
- The circuit is inherently current-limited (higher impedance sources, lower available fault current).
- Service speed matters (quick “is it blown? check).

A common OptiFuse example is the FSD 5x20mm glass fast-acting series fuse for IEC style applications.

When ceramic is the safer (and often required) choice

Use a ceramic tube fuse when:

- Fault current could be meaningfully higher (more available energy)
- The design or legacy BOM calls for ceramic.
- You’re trying to reduce risk during hard shorts

OptiFuse highlights the FCD series as a compact, fast-acting ceramic option used for sensitive electronics protection, with published high interrupt ratings.

Substitution rule of thumb

Ceramic → Glass: avoid unless you’ve verified interrupt rating, voltage rating (AC/DC), time-current behavior, approvals, and physical fit.

Glass → Ceramic: Often acceptable if you match all ratings/approvals and ensure the holder/clip system is compatible.