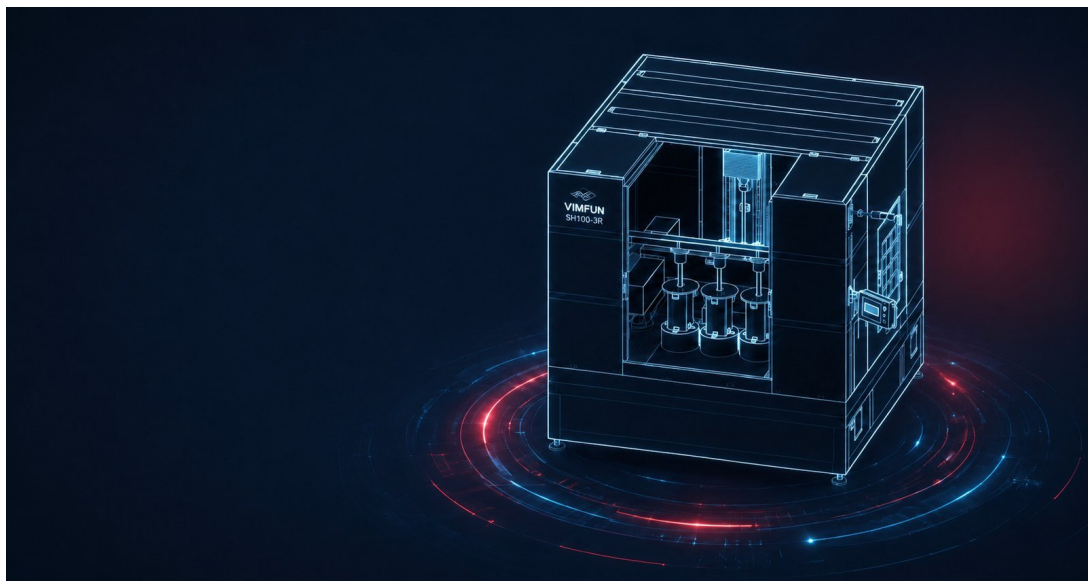


Hard & Brittle Materials Cutting Guide

A practical planning framework for diamond wire loop cutting of quartz, glass, ceramics, sapphire, silicon, graphite and ferrite.



Wire diameter range	Wire speed	Best use
0.35-0.80 mm	Up to 80 m/s, subject to machine and wire	Trial-cut planning and process comparison

1. Why process planning matters

Hard and brittle materials can develop micro-cracks, edge chipping and surface damage when wire selection, support, feed or cooling are not matched to the workpiece. Use the ranges in this guide as a trial-cut framework, then validate them with the actual material grade, dimensions and finish requirement.

Recommended setup sequence

- Confirm material grade, dimensions, orientation and value of the workpiece.
- Define kerf allowance, edge condition, flatness and surface-finish targets.
- Choose wet cutting or dry dust extraction based on material compatibility.
- Select wire diameter and coating before optimizing speed, tension and feed.
- Run a short trial cut, inspect the edge and surface, then adjust one variable at a time.

Core variables to record

Variable	What to confirm	Typical risk if incorrect
Wire diameter	Kerf allowance, cut radius, surface target	Excess waste or insufficient stiffness
Wire speed	Machine limit, coating, coolant and material	Heat, glazing or unstable removal
Wire tension	Loop size, guides and workpiece contact	Wire deflection or breakage
Feed rate	Material response and contact length	Chipping, bow or poor finish
Cooling / extraction	Wet compatibility and dust control	Thermal damage, contamination or wear
Fixturing	Support area, orientation and exit edge	Movement, vibration or exit chipping

2. Material-specific trial-cut checklist

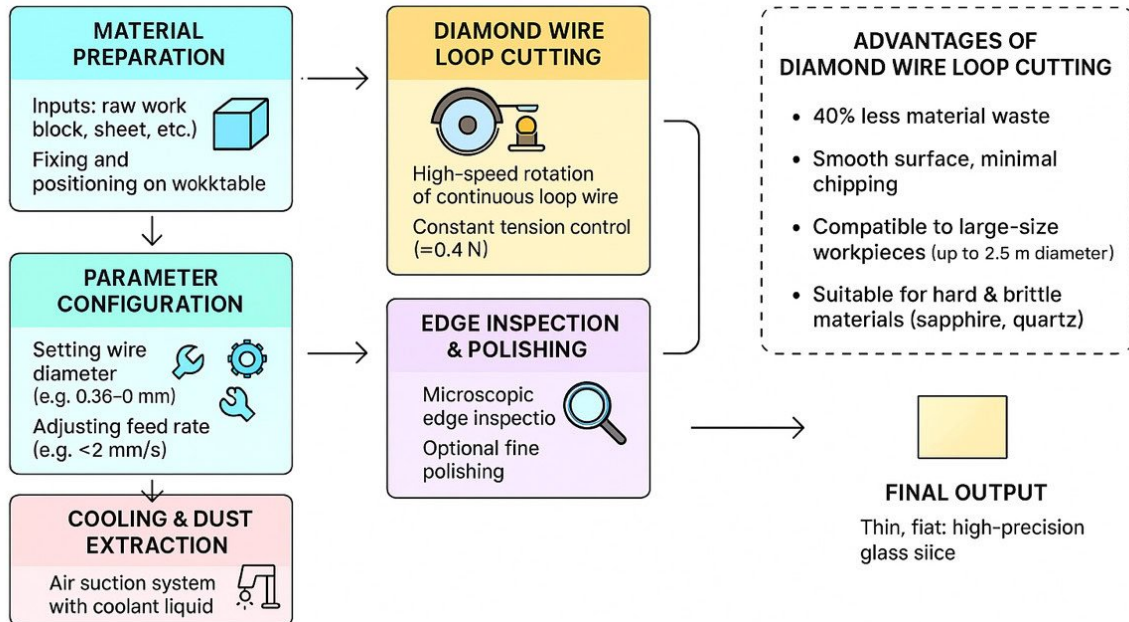
Material	Primary concern	Process choice to verify	Inspection focus
Quartz / fused silica	Edge chips and subsurface damage	Stable wet cooling and rigid support	Exit edge, micro-cracks, flatness
Alumina ceramic	Brittle fracture and local breakout	Low initial feed and full support	Corner integrity and surface marks
Sapphire	High hardness and anisotropic response	Wire coating, orientation and coolant	Edge quality and cut direction
Silicon / SiC	Kerf loss and brittle edge damage	Thin wire, controlled tension and feed	Kerf, bow and contamination
Graphite	Dust and rapid abrasive wear	Dry extraction or compatible coolant	Dust capture and wire condition
Ferrite / magnets	Chipping and magnetic debris	Fixturing, extraction and low feed	Exit edge and debris control

Important

Exact cutting parameters depend on machine model, wire specification, workpiece geometry, contact length, coolant and required surface quality. Validate the final process with a representative sample before production.

3. Endless diamond wire cutting workflow

VIMFUN Endless Wire Saw System – Diamond Wire Loop Cutting Process for Hard & Brittle Materials



Trial-cut record

Item	Record before the test
Material and grade	_____
Workpiece dimensions	_____
Machine and fixture	_____
Diamond wire	Diameter _____ Coating _____ Loop length _____
Starting parameters	Speed _____ Tension _____ Feed _____
Cooling / extraction	_____
Inspection result	Kerf _____ Edge _____ Surface _____ Time _____

Need a machine or wire recommendation?

levy@endlesswiresaw.com |
www.endlesswiresaw.com