



KEVIN Process Advisor by AmeriCOM: Operator Training Manual

KEVIN helps technicians make better polishing decisions by combining current part information, measured optical condition, process settings, and historical polishing results. This manual explains what to enter, why the information matters, and how KEVIN uses it to recommend the next polishing move.

Overview: Recommended Workflow

- Enter part, geometry, pad, slurry, and machine setup information.
- Enter the current and target measurement values.
- Select the surface error pattern and run KEVIN.
- Review the recommendation, math, historical evidence, and risk warnings.
- Perform the polishing run and measure the optic again.
- Record the actual results and log the run to the repository.

Job + Geometry

What KEVIN is doing: KEVIN builds the starting model for the optic. It looks at material, surface shape, aperture, thickness, and ROC to understand the part before any polishing adjustment is recommended.

Why this information is needed: Geometry controls how aggressive a process can safely be. Thin or high-aspect-ratio parts are more sensitive to pressure and can flex, which can create misleading measurement changes or add form error.

Job + Geometry

Enter the job details and lens geometry before starting the analysis.

Run ID LCO1-1 / Run 01	Technician Technician name	Material Fused Silica	Surface Shape Convex	Back Surface Geometry Convex
Aperture Diameter (mm)	Center Thickness (mm)	Edge Thickness (mm)	Lens ROC (mm)	
RECOMMENDED POLISHER 0.00 mm Ideal setup output, not required input	ASPECT RATIO —:1 diameter = thickness	TARGET RATIO 1.50× standard setup ratio	FLEX RISK — pressure guardrail	GEOMETRY RISK Normal No major geometry concerns detected.

Callout Guide:

1. Run ID: unique name for this polishing run.
2. Technician: operator completing the run.
3. Material: optic material; KEVIN uses this to adjust expected polishing response.
4. Surface Shape: convex, concave, or plano surface being corrected.
5. Back Surface Geometry: geometry on the opposite side of the optic.

6. Aperture Diameter: clear aperture or working diameter.
7. Center Thickness: thickness through the center of the optic.
8. Edge Thickness: thickness at the optic edge.
9. Lens ROC: current or nominal radius of curvature.
10. Recommended Polisher: KEVIN's calculated tool-size guidance.
11. Aspect Ratio: diameter-to-thickness indicator used for flex risk.
12. Target Ratio: normal setup ratio KEVIN compares against.
13. Flex Risk: pressure guardrail based on geometry.
14. Geometry Risk: overall geometry warning status.

Pad, Slurry, and Current Machine Setup

What KEVIN is doing: KEVIN reads the current consumables and machine settings so it can recommend changes that fit the actual polishing setup.

Why this information is needed: Pad type, pad hardness, slurry chemistry, stroke, pressure, speed, and cycle time all affect removal behavior. If these values are wrong, the recommendation may be too aggressive or too conservative.

Pad + Slurry		Current Machine Setup	
Select the pad and slurry currently being used on the machine.		Enter the machine settings currently running on the polisher.	
Pad Type Polyurethane hard / IC1000 1		Stroke Distance (mm) 5 5	Bladder Pressure (PSI) 1.6 6
Pad Durometer Hard 2		Speed Factor (Auto) ? 0.509 7	Cycle Time (min) 21 8
Slurry Baume 5 3	Slurry pH 7.2 4	Tool Speed (RPM) 55 9	Part Speed (RPM) 28 10

Callout Guide:

1. Pad Type: polishing pad currently on the machine.
2. Pad Durometer: pad hardness.
3. Slurry Baume: slurry concentration.
4. Slurry pH: slurry chemistry condition.
5. Stroke Distance: current stroke setting.
6. Bladder Pressure: current pressure setting.
7. Speed Factor: automatically calculated speed relationship.
8. Cycle Time: current run time.
9. Tool Speed: polisher/tool RPM.
10. Part Speed: optic/carrier RPM.

Measurement Entry

What KEVIN is doing: KEVIN compares the current optical condition to the target condition. The size and direction of these gaps drive the recommendation.

Why this information is needed: Accurate measurement entry tells KEVIN what needs to change. Power/ROC values drive radius correction. Irregularity and pattern selection tell KEVIN what form error is present.

Power / Radius of Curvature

Enter the measured and target power values for this optic.

Power Error Now 1	Target Power Error 2	ROC Now (mm) 3	Target ROC (mm) 4
1	0.15	69.18	69.11

POWER GAP
0.850
current – target

ROC GAP
0.070 mm
current – target

CORRECTION SEVERITY
74%
scales recommendation size

Irregularity / Form Error

Select the surface error pattern observed in the interferometer results.

Irregularity Now 5	Target Irregularity 6	Units 7	Priority 8
0.32	0.12	fringes	Balanced

 **Low 9 / edge roll**
usually lower low too

 **High 10 / center bump**
often center bump

 **Center 11 / SA3 bump**
remove center

 **Center 12 / SA3 hole**
reduce center action

 **Astigmatism 13**
check back/support

 **Coma 14**
alignment/decenter

 **Pent 15 / edge lobes**
speed issue

 **Texture 16 / MSF**
pad, slurry, speed ratio

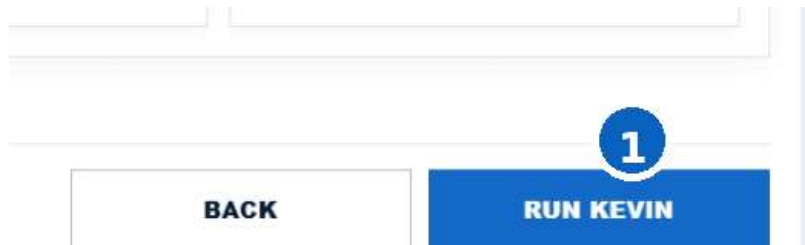
Callout Guide:

1. Power Error Now: current measured power error.
2. Target Power Error: desired power value.
3. ROC Now: current radius measurement.
4. Target ROC: required radius.
5. Irregularity Now: current form error.
6. Target Irregularity: required form tolerance.
7. Units: measurement units used for irregularity.
8. Priority: whether KEVIN should balance correction or favor power/ROC or irregularity.
9. 9-16. Pattern Selection: select the pattern that best matches the interferometer result.

Run KEVIN

What KEVIN is doing: When Run KEVIN is selected, KEVIN combines the part model, measurements, process settings, and historical evidence to create a recommended next move.

Why this information is needed: The recommendation is only as good as the data entered. Review the entries before running the analysis.



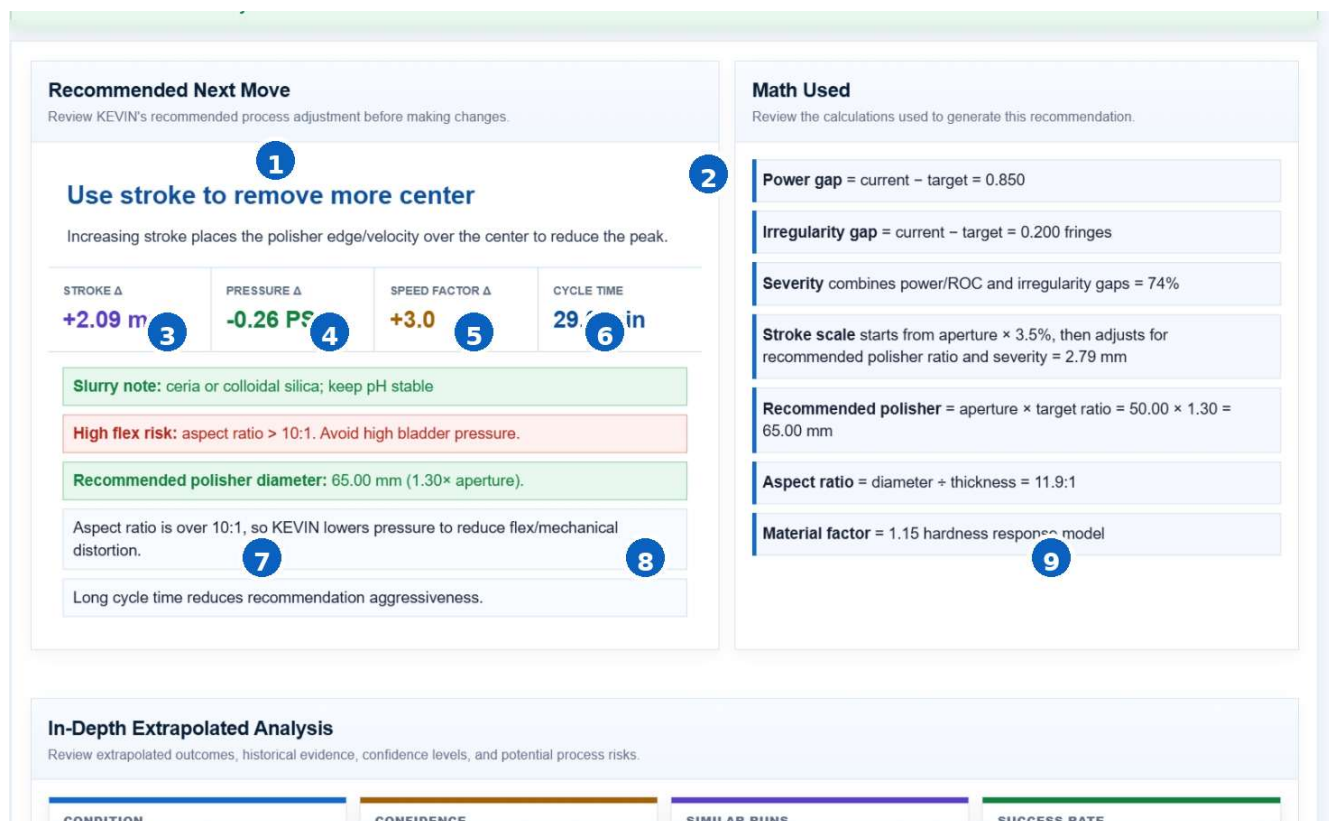
Callout Guide:

1. Run KEVIN: starts the recommendation engine.

Recommendation Review

What KEVIN is doing: KEVIN presents a recommended next move, the calculations used, similar historical runs, confidence level, and risk warnings.

Why this information is needed: This page helps the technician understand not just what KEVIN recommends, but why. The math and historical evidence support better decision-making before machine settings are changed.



Recommended Next Move
Review KEVIN's recommended process adjustment before making changes.

1 **Use stroke to remove more center**

Increasing stroke places the polisher edge/velocity over the center to reduce the peak.

STROKE Δ	PRESSURE Δ	SPEED FACTOR Δ	CYCLE TIME
+2.09 mm 3	-0.26 PSI 4	+3.0 5	29.7 in 6

Slurry note: ceria or colloidal silica; keep pH stable

High flex risk: aspect ratio > 10:1. Avoid high bladder pressure.

Recommended polisher diameter: 65.00 mm (1.30× aperture).

Aspect ratio is over 10:1, so KEVIN lowers pressure to reduce flex/mechanical distortion. **7**

Long cycle time reduces recommendation aggressiveness. **8**

Math Used
Review the calculations used to generate this recommendation.

2

- Power gap** = current – target = 0.850
- Irregularity gap** = current – target = 0.200 fringes
- Severity** combines power/ROC and irregularity gaps = 74%
- Stroke scale** starts from aperture × 3.5%, then adjusts for recommended polisher ratio and severity = 2.79 mm
- Recommended polisher** = aperture × target ratio = 50.00 × 1.30 = 65.00 mm
- Aspect ratio** = diameter ÷ thickness = 11.9:1
- Material factor** = 1.15 hardness response model **9**

In-Depth Extrapolated Analysis
Review extrapolated outcomes, historical evidence, confidence levels, and potential process risks.

CONDITION	CONFIDENCE	SIMILAR RUNS	SUCCESS RATE
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Callout Guide:

1. Recommended Next Move: primary process adjustment.
2. Math Used: calculations and rule logic behind the recommendation.
3. Stroke Change: recommended stroke adjustment.

4. Pressure Change: recommended pressure adjustment.
5. Speed Factor Change: recommended speed relationship change.
6. Cycle Time: recommended run time.
7. One Primary Change: simplified action guidance.
8. Historical Evidence: similar previous runs used for comparison.
9. Risk Warnings: conditions that require caution.

Recording Actual Results

What KEVIN is doing: KEVIN captures what actually happened after polishing. This closes the loop between recommendation and outcome.

Why this information is needed: Recorded results become historical evidence. Future recommendations improve when technicians log actual changes, final measurements, and observations.

After the Run

Record the actual results after polishing so KEVIN can continue learning.

Actual Stroke Δ 1	Actual Pressure 2	Actual Speed 3	Actual Time 4
2.09	-0.26	3	29
Actual Polisher Used (mm) 5	Power Error After 6	ROC After (mm) 7	Irregularity After 8
65			
KEVIN useful? 9	Recommendation followed? 10	Effectiveness Score 11	
Good	Yes	1-5	
Technician Notes What changed? What did the surface do? Any pad/slurry/chuck observations? 12			
CALCULATE RESULT 13			

Callout Guide:

1. Actual Stroke Change: stroke adjustment used.
2. Actual Pressure Change: pressure adjustment used.
3. Actual Speed Change: speed adjustment used.
4. Actual Time: actual cycle time.
5. Actual Polisher Used: tool diameter used.
6. Power Error After: final power result.
7. ROC After: final radius result.
8. Irregularity After: final form result.
9. KEVIN Useful?: technician judgment of usefulness.
10. Recommendation Followed?: whether the recommendation was followed.
11. Effectiveness Score: 1-5 rating.
12. Technician Notes: observations, lessons learned, or concerns.
13. Calculate Result: generates the outcome summary.

Repository Controls

What KEVIN is doing: The repository stores the historical run database that powers KEVIN's learning and comparison features.

Why this information is needed: Repository tools allow the user to search, review, import, export, and maintain process knowledge over time.

The screenshot shows a web interface for managing a repository. At the top, under the heading "Repository CSV Tools", there are five buttons: "Choose File" (with a blue circle 1), "APPEND WITH CSV" (with a blue circle 2), "REPLACE WITH CSV" (with a blue circle 3), "DOWNLOAD CSV" (with a blue circle 4), and "DOWNLOAD TEMPLATE" (with a blue circle 5). Below these buttons is a small text note: "Append adds imported rows to the repository. Replace removes current rows and uses the selected CSV as the new repository." Below this is a section titled "Repository loaded." which contains a search bar (with a blue circle 6), a "REFRESH" button (with a blue circle 7), a "DELETE SELECTED" button (with a blue circle 8), and a status display showing "14 shown / 14 total" (with a blue circle 9).

Callout Guide:

1. Choose File: select a CSV file for import.
2. Append with CSV: add imported rows to the existing repository.
3. Replace with CSV: replace the repository with the selected file.
4. Download CSV: export current repository data.
5. Download Template: download a blank import template.
6. Search: filter runs by run ID, technician, material, pattern, or notes.
7. Refresh: reload repository records.
8. Delete Selected: remove checked entries.
9. Count Display: shows the number of visible and total records.

Repository Table

What KEVIN is doing: The repository table lets technicians review prior runs and compare current conditions to historical outcomes.

Why this information is needed: Historical review helps reduce trial-and-error by showing which settings worked for similar materials, shapes, patterns, and measurements.

1	2	3	4	5	6	7	ROC	8	PATTERN	9	REC. POLISHE	10
				TIAL	URFACE							TUAL
☐	Edit	Sarah test1 6/18/2026, 11:53:58 AM	Ruth B. Ginspurr	fused_silica	cx	50	69.11		astigmatism	65.00	—	
☐	Edit	LC01-1 / Demo Run 6/18/2026, 11:54:01 AM	Britney Spears	fused_silica	cx	50	69.11		astigmatism	65.00	—	
☐	Edit	Sarah test 55 6/18/2026, 1:54:02 PM	Dianne Keaton	fused_silica	cx	50	69.11		astigmatism	65.00	—	
☐	Edit	TESTING 6/18/2026, 12:06:07 PM	Cardi B	germanium	plano	50	20		coma	75.00	—	
☐	Edit	LC01-1 / Demo Run 6/18/2026, 12:14:07 PM	Ruth B. Ginspurr	fused_silica	cx	50	69.11		astigmatism	65.00		3.00
☐	Edit	new test 6/18/2026, 12:16:22 PM	Elphaba	caf2	plano	50	39999		high_edge	75.00	—	
☐	Edit	pad Test 6/18/2026, 12:40:08 PM	DJ Tanner	zerodur	plano	50	39999		low_edge	75.00		4.00
☐	Edit	LC01-1 / Demo Run 6/18/2026, 4:27:39 PM	Ruth B. Ginspurr	silicon	cc	6	69.11		pentafoil	9.00		5.00
☐	Edit	test 6/22/2026, 12:05:40 PM	sarah	silicon	plano	2	30		astigmatism	3.00		3.00
☐	Edit	test upload test upload	test upload	test upload	test upl...	test upl...	test upload		test upload	—		—
☐	Edit	Agentic Test 6/30/2026, 1:32:52 PM	Sarah	zerodur	cx	4	5		high_edge	5.60		5.60
☐	Edit	New TEST 6/30/2026, 1:34:00 PM	Ruth B. Ginspurr	fused_silica	cx	50	69.11		low_edge	65.00		65.00
☐	Edit	LC01-1 / Demo Run										

Callout Guide:

1. Select Checkbox: mark a row for deletion.
2. Edit: expand the row for editing.
3. Run: run identifier and timestamp.
4. Technician: operator who logged the run.
5. Material: optic material.
6. Surface: surface shape.
7. Diameter: aperture or working diameter.
8. ROC: radius of curvature.
9. Pattern: surface error pattern.
10. Recommended Polisher: KEVIN's tool-size recommendation.

Frequently Asked Questions

Does KEVIN replace technician judgment?

No. KEVIN is a decision-support tool. Technicians should review the recommendation, math, historical evidence, and risk warnings before making changes.

Why does KEVIN need geometry information?

Geometry affects flex risk, pressure sensitivity, recommended tool size, and how aggressive the next move should be.

What if my interferogram does not exactly match one pattern?

Choose the closest pattern and explain any uncertainty in Technician Notes.

Why should every run be logged?

Logged runs create the historical evidence KEVIN uses to compare future jobs and improve recommendations.

Can I edit a run after saving it?

Yes. Use the Repository page, select Edit on the row, make the correction, and save the record.

Run KEVIN button does not produce a recommendation.

Check that all required measurement fields are completed and that a pattern is selected.

Recommendation seems too aggressive.

Check geometry, thickness, units, pressure, and cycle time. Review the risk warnings before making the change.

Repository does not load.

Refresh the page and verify that the browser has network access to the repository file.

The wrong units were entered.

Correct the measurement fields before logging the run. If the run was already saved, edit it in the repository.

Run result will not save.

Complete all required final-result fields and add notes if the outcome is unusual.