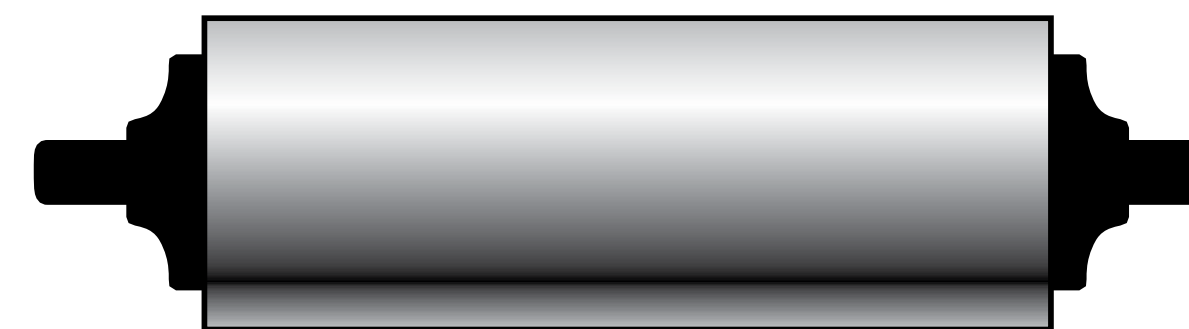


RUBBER MATERIAL SAVINGS THROUGH PRECISION ROLL GRINDING

PRECISION



ROLL GRINDERS

Over 50 years of value-added service

**WEBINAR
SERIES**

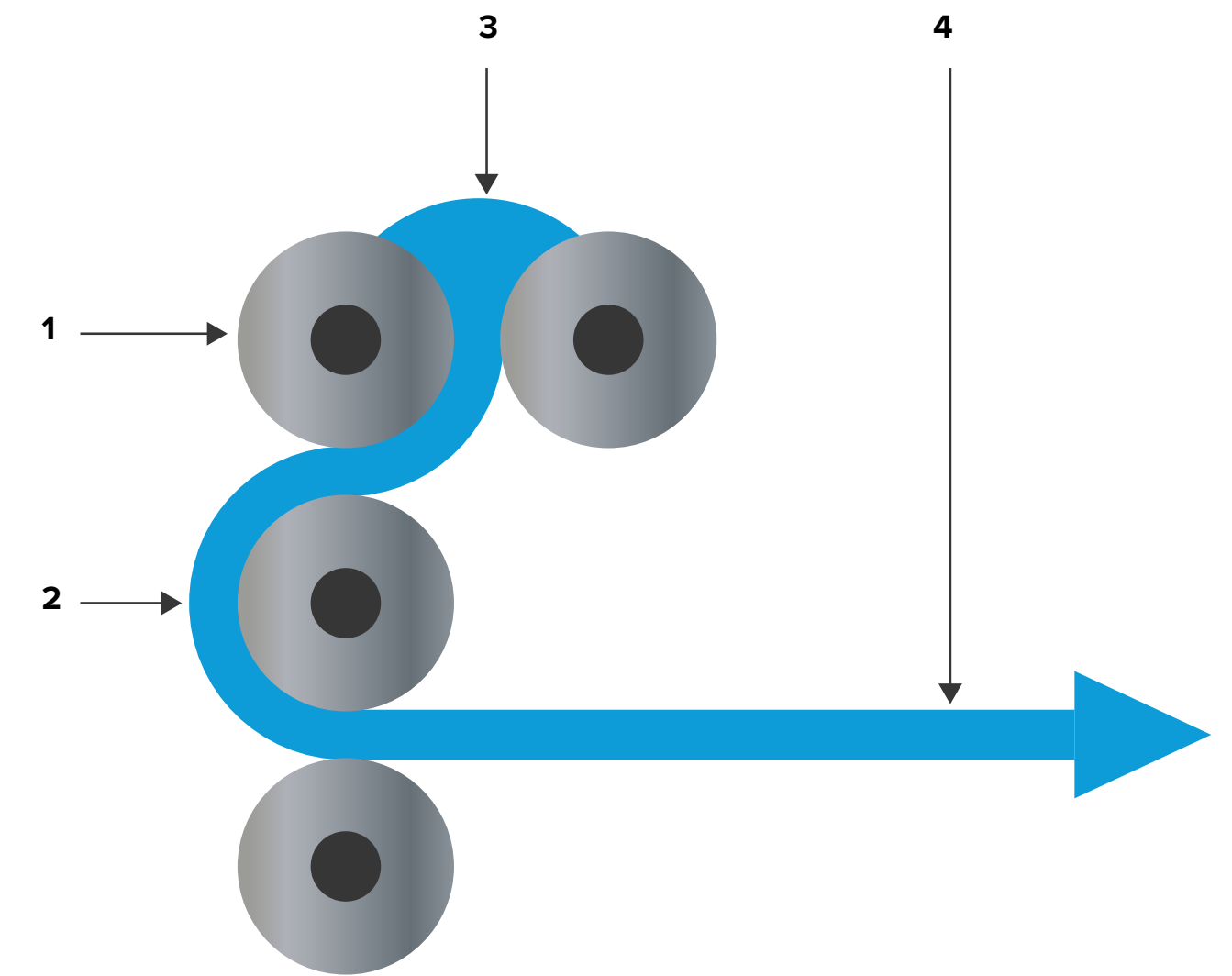
precisionrollgrinders.com

MATERIAL SAVINGS WITH PRECISION CALENDER ROLLS

RUBBER CALENDERS ARE PRECISION EQUIPMENT. PRECISION IN ROLL GRINDING AND SERVICE IS CRITICAL FOR PROPER OPERATION.

Rubber calendering system – difficult to take full advantage of the following features without precision rolls ...

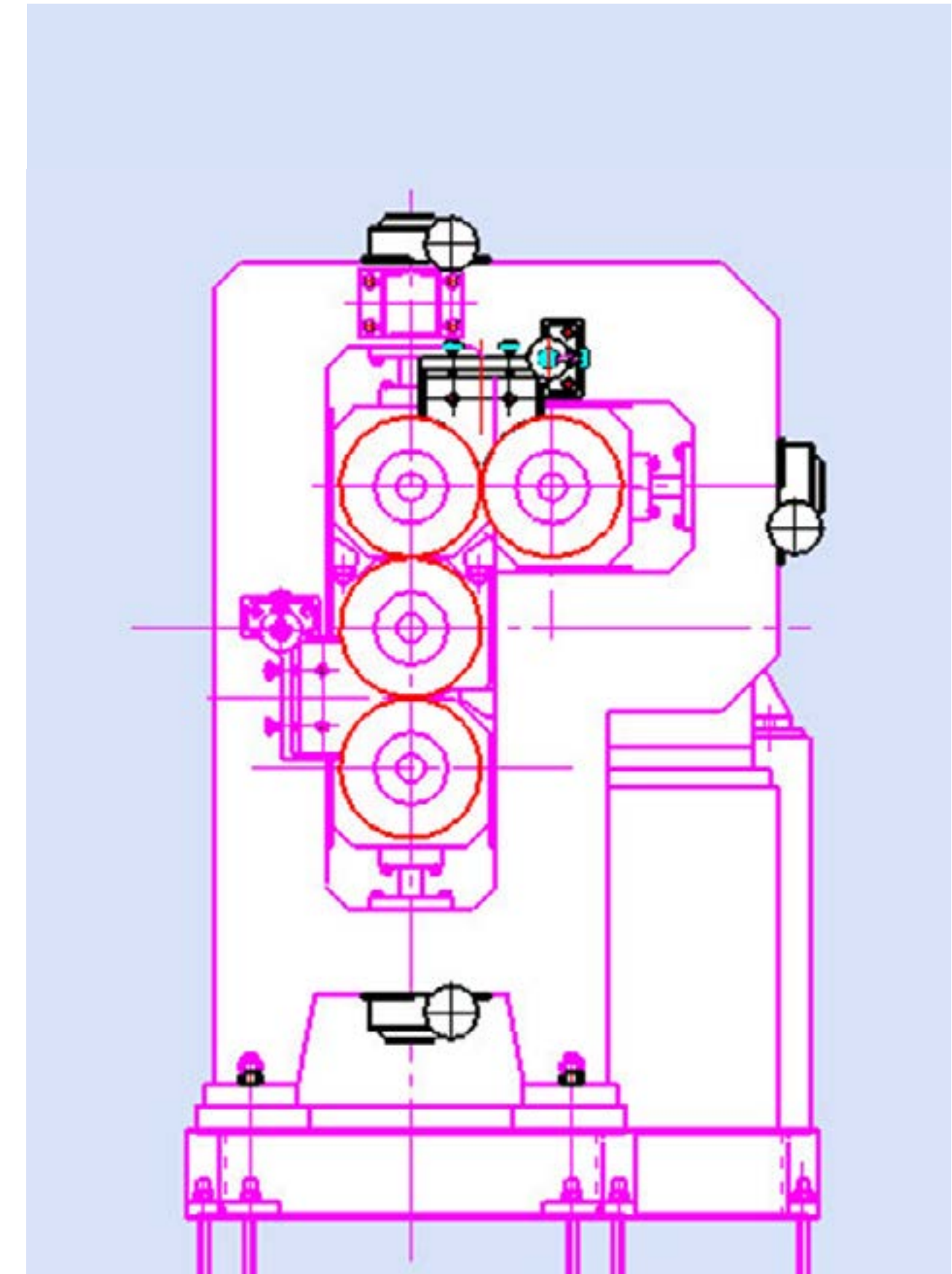
- Individual roll-drive motors offer infinite friction ratios
- Cross-axis control systems (rolls #1 and #4)
- Automatic temperature control units for each roll
- Hydraulic roll bending
- Nuclear mass measuring and automatic gauge control system, fully equipped operator control panel with automatic and manual mode capabilities
- Let-off and wind-up accumulators provide uninterrupted production during raw and finished roll changes
- Cooling drum tower provides stable control over material tack levels
- Extrusion feed system – capable of running the toughest of stocks
- Automatic web centering and width control units
- Pre-tension and post-tension control units
- Fully integrated drive system, recently upgraded
- Heavy-duty hydraulic splice press
- Dual textile roll let-off stations
- Dual finished material windup and liner let-off stations



MATERIAL SAVINGS WITH PRECISION CALENDER ROLLS

CALENDER ROLL PERFORMANCE — FOUNDATIONAL PRINCIPLES

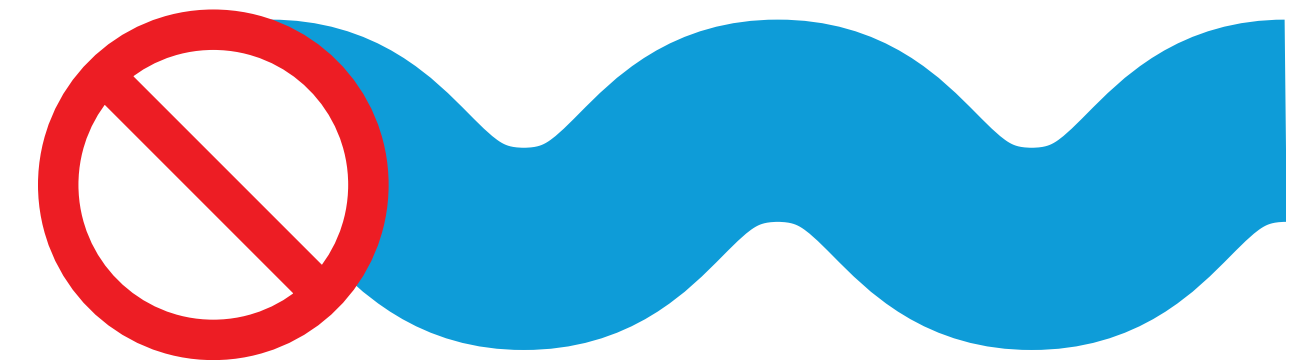
- Uniform sheet caliper (thickness)
- Uniform roll surface temperature and temperature transfer
- Start-up and run life



UNIFORM SHEET THICKNESS MATTERS

UNIFORM SHEET CALIPER (THICKNESS)

- Reduced material usage due to a thick or “wavy” sheet
- Reduced defects due to localized thinning in the sheet
- Improved end-product construction
 - Reduce defects caused by a deviation in the sheet thickness
 - Improved construction productivity with a more uniform sheet thickness



UNIFORM SHEET THICKNESS MATTERS

REAL-WORLD CASE STUDY OF PRECISION-GROUND ROLLS REDUCING SHEET THICKNESS VARIABILITY

Value Added In Rubber Manufacturing PRECISION ROLL GRINDERS INC.



50 Years

PRG has been the premier cylindrical shaft and roll grinding company in the Western hemisphere with over half a century of experience.

Your Production Line Could be Saving Money and Time with Increased Quality.

Your production line may be experiencing excessive material use, unplanned shutdowns, and even poor quality. Many of these problems could be improved or even avoided with something as simple as a high quality grind for your rolls.

"PRG can grind to tolerances as small as 0.00002 or 20 millionths of an inch"

PRG can significantly increase your material savings.

Rubber Roll Profile (Standard Grind)

Rubber Sheet Profile (PRG Grind)

Wasted Rubber

Wasted Rubber

VS

With the higher tolerances and quality at PRG, your rolls will always be ground to the proper specifications. The results that can be seen in your plant is a far superior rubber sheet profile. This leads to significant savings in material and more of your product falling within your desired tolerances.

See the other side to learn more

Tighter Tolerances Means Bigger Savings

Parameter

Value

W = Sheet Width (in)

48

S = Sheet Speed (FPM)

130

D = Days/Year in Operation

250

C = Avg. Cost in \$ per lb (Mat'l & Labor)

1.5

SG = Specific Gravity of Material

1.2

PPI = Calculated lbs/in

0.04332

T = Tolerance With Current Grinding Method (+/- inches)

0.0004

PRGT = Tolerance with PRG Grinding Method (+/- inches)

0.00002

Average Annual Savings

\$525,496

Calculation

W*S*12 in/ft*D*1440 min/day*(C*PPI)*(T-PRGT)/SG

1/10,000 inch may sound unimportant in an industry that creates thousands of feet of product a day in large scale operations, but the impact on the material savings is tremendous. The model to the left demonstrates the possible savings that our tolerances can achieve. As small as only a 2/10,000 inch difference can result in over a half million dollars in savings every year!

We Do More Than Just Roll Grinds

• Brush Electroplating

• Calender Rolls

• Coatings

• Chrome Plating

• Custom Grinding

• Descaling

• Dynamic Balancing

• Heat Grinding

• Journal Repair

• Multi-Blending

• Metal Industry Mill Rolls

• Metal Spraying

• Mirror Polishing

• Near Chilled Iron Rolls and Shells

• Regrooving Rubber and Polyurethane

• Roll Fabrication

• Section Roll Retreads

• Turning

• Variable Crown (VC) Roll Retreads

Want to Find Out More?

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Locations

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(770) 830-6323
400 Barnes Dr

Lewisport, KY
(270) 295-4990
200 Industrial Park Rd

Texasarkana, AR
(870) 216-4000
4000 E 19th St

Proud to Partner With

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UNIFORM ROLL TEMPERATURE MATTERS

UNIFORM ROLL SURFACE TEMPERATURE: TEMPERATURE TRANSFER AND ROLL TIR

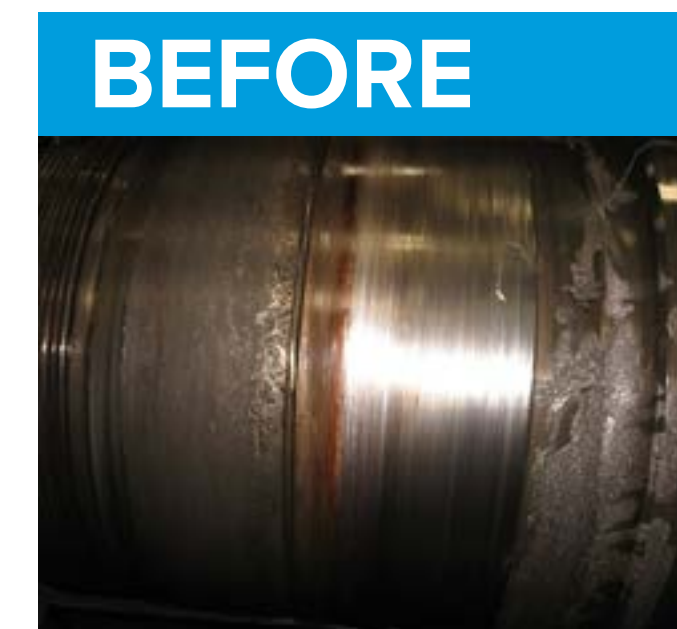
- Temperature control
- Reduce sheet scorching and hot spots
- Prevent “thermal” runout (TIR) due to plugged passage
 - Can cause MD sheet variation
- Increase production speeds



ROLL LIFE AND START-UP MATTERS

PRECISION MAINTENANCE IS MORE THAN JUST PRECISION GRINDING

- Thorough inspection of bearings and housings
- Proper assembly of bearings and housing especially Timken cup and cone double row bearings
- Replace worn or damaged bearings and bushings
- Journal repair and replacement
- Start up on time and producing profitable product



ROLL LIFE AND START-UP MATTERS

PRECISION MAINTENANCE IS MORE THAN JUST PRECISION GRINDING

CLOSURES

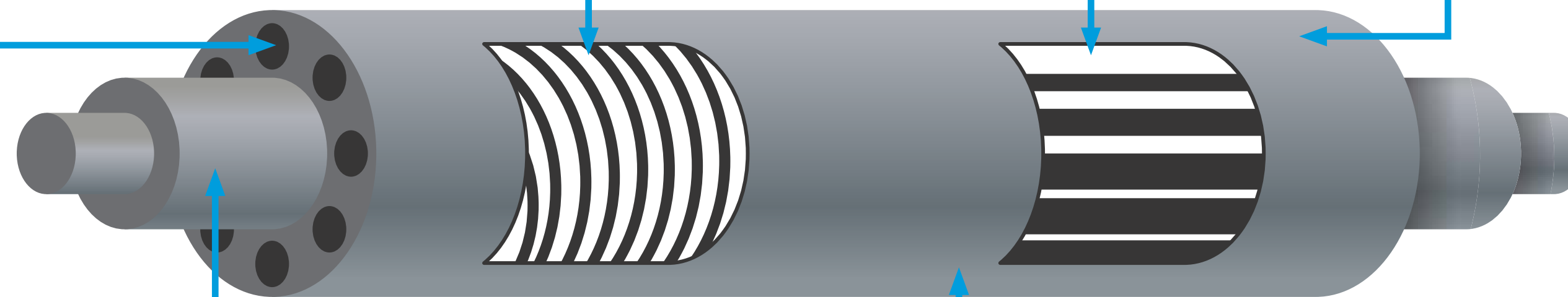
Thoroughly inspect all closures and repair or replace where needed. Replace gaskets. Retorque closures to specifications and pressure-check for safety.

INTERNAL

Clean all interior fluid passages to eliminate cold- or hot-spot potential caused by blockages. Inspect for build-up and proper flow rates.

SURFACE

Grind (cold or hot grinding methods), rechrome and patch-plate repair roll surfaces as required. Carbide recoating option available for longer life between regrinds



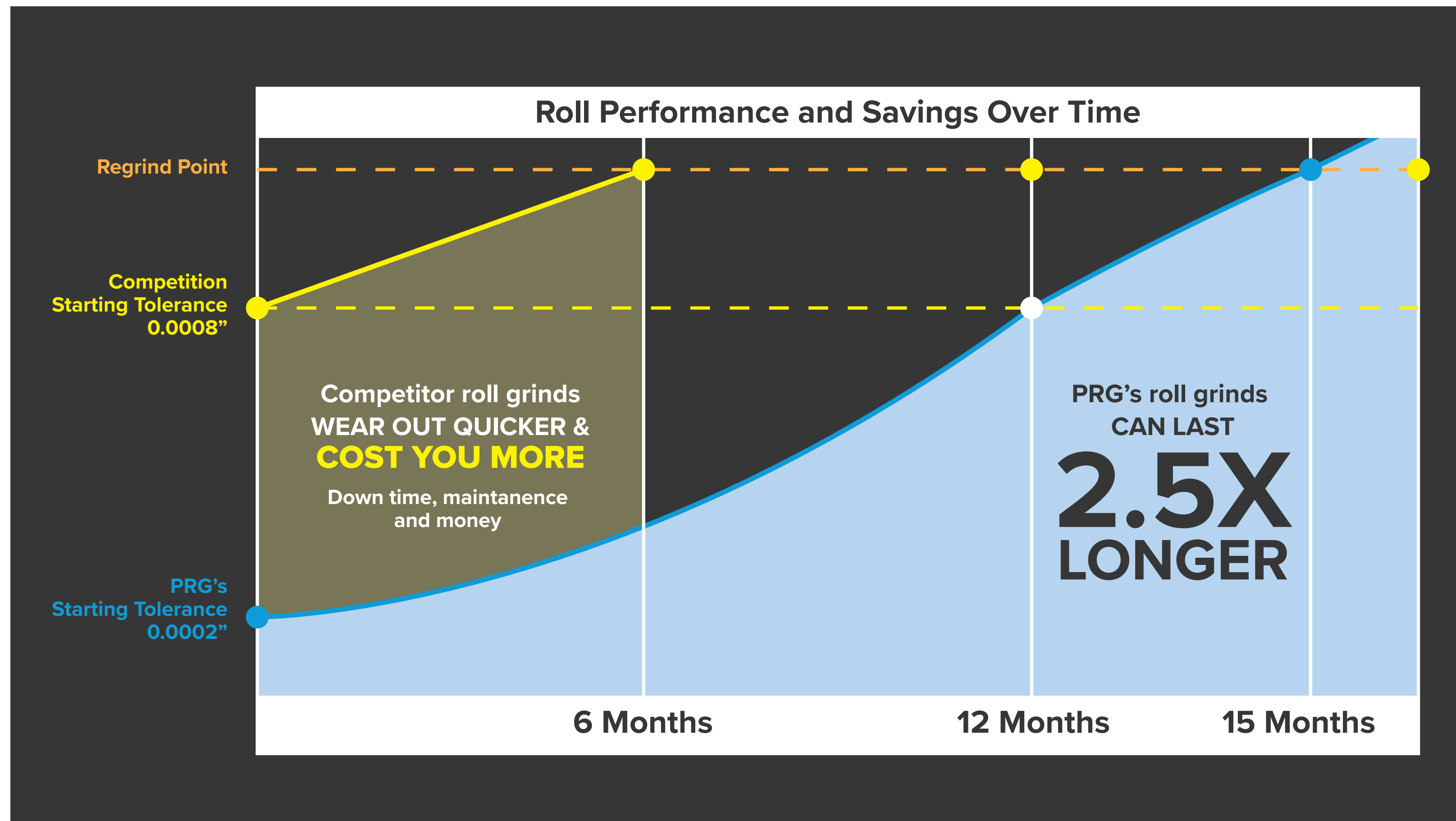
JOURNALS

Complete repairs available from brush grinding, and chrome and nickle plating ... to replacement of inner race, or other components, as required. Future journal replacement option is also available.

PROFILE

Computer-controlled profiling is available to produce the specific roll shape required to optimize your production process and improve product quality.

ROLL LIFE AND START-UP MATTERS



**ROLLS THAT
START CLOSER
TO PERFECTLY
ROUND, RUN
LONGER!**

LIMITATIONS OF BLOCK GRINDING

MACHINE DIRECTION CALIPER CANNOT BE OPTIMIZED

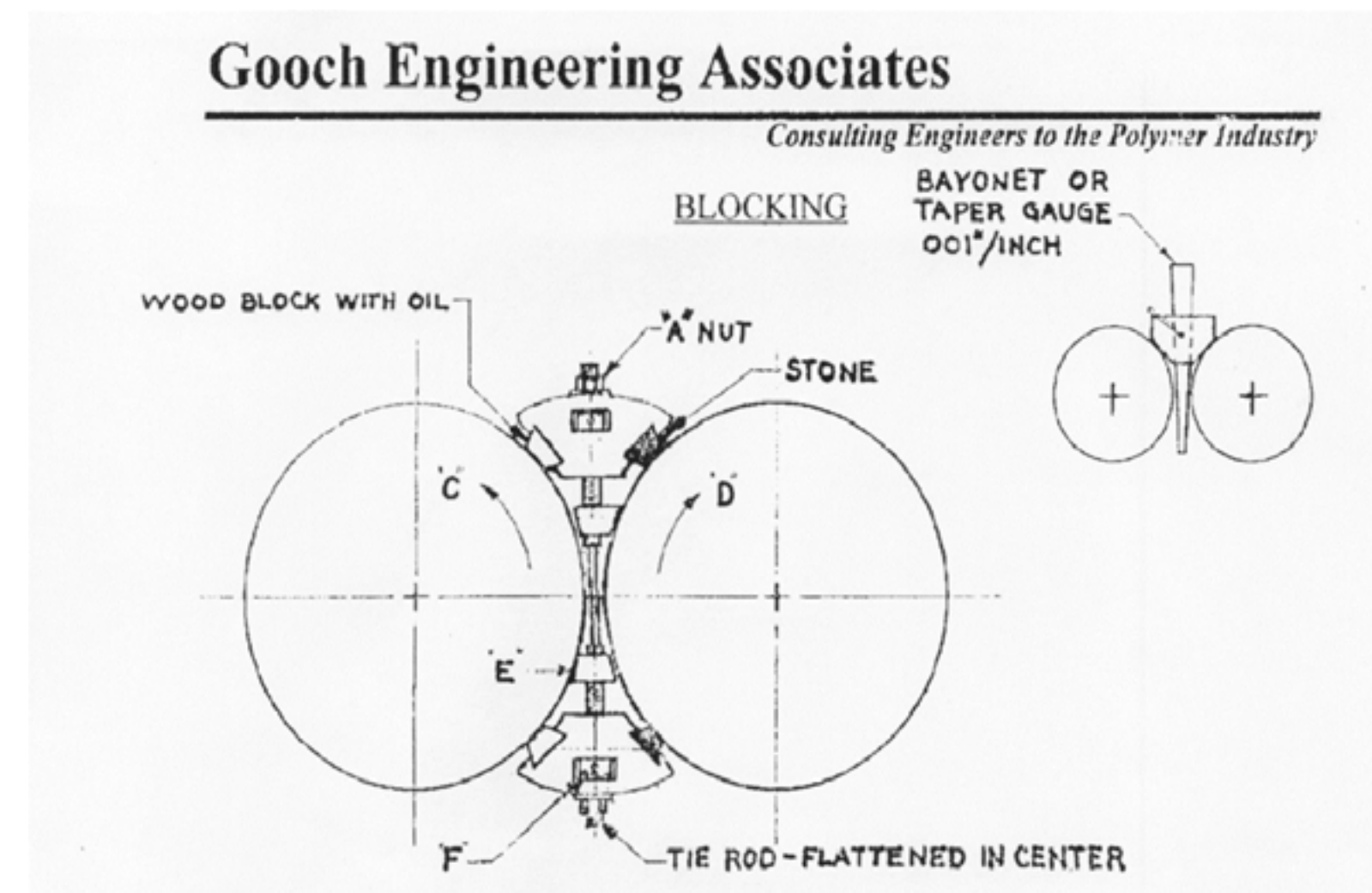
- ☑ Block grinding cannot achieve necessary concentricity and roundness

CROSS DIRECTION CALIPER VARIATION

- ☑ Shape (profile) limited ($\pm .001''$)

CALENDERED SHEET IS NOT UNIFORM

- ☑ Wasteful variation in caliper
- ☑ Product tolerances are large



SAVINGS THROUGH PRECISION ROLL GRINDING



ROLLS GROUND TO 0.0002” ON BARE JOURNALS

PRECISION GRINDING CORRECTS MD SHEET CALIPER

- Grind roundness of the journals and roll face to .0001”
- Grind to proper concentricity (TIR)

PRECISION GRINDING CORRECTS CD SHEET CALIPER

- Shape (profile) ground to .0002” or better

FINISH CALENDERED SHEET UNIFORMITY

- Uniform MD and CD sheet caliper with less variability
- Product tolerances are uniform and accurate

PRG PROMISE TO PROVIDE VALUE – CASE STUDY

Value Added In Rubber Manufacturing PRECISION ROLL GRINDERS INC.



50
Years

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C = Avg. Cost in \$ per lb (Mat'l & Labor)	1.5
SG = Specific Gravity of Material	1.2
PPI = Calculated lbs/in	0.04332
T = Tolerance With Current Grinding Method (+/- inches)	0.0004
PRGT = Tolerance with PRG Grinding Method (+/- inches)	0.0002
Average Annual Savings	\$525,496
Calculation	
$W \times S \times 12 \text{ in/ft} \times D \times 1440 \text{ min/day} \times C \times PPI \times (T^2 - PRGT^2) \times SG \times 50\%$	

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- Dynamic Balancing
- Dynamic Leak Testing
- Hot Grinding
- Journal Repair
- Media Blasting

- Metal Industry Mill Rolls
- Metal Spraying
- Mirror Polishing
- New Chilled Iron Rolls and Shells
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www.precisionrollgrinders.com

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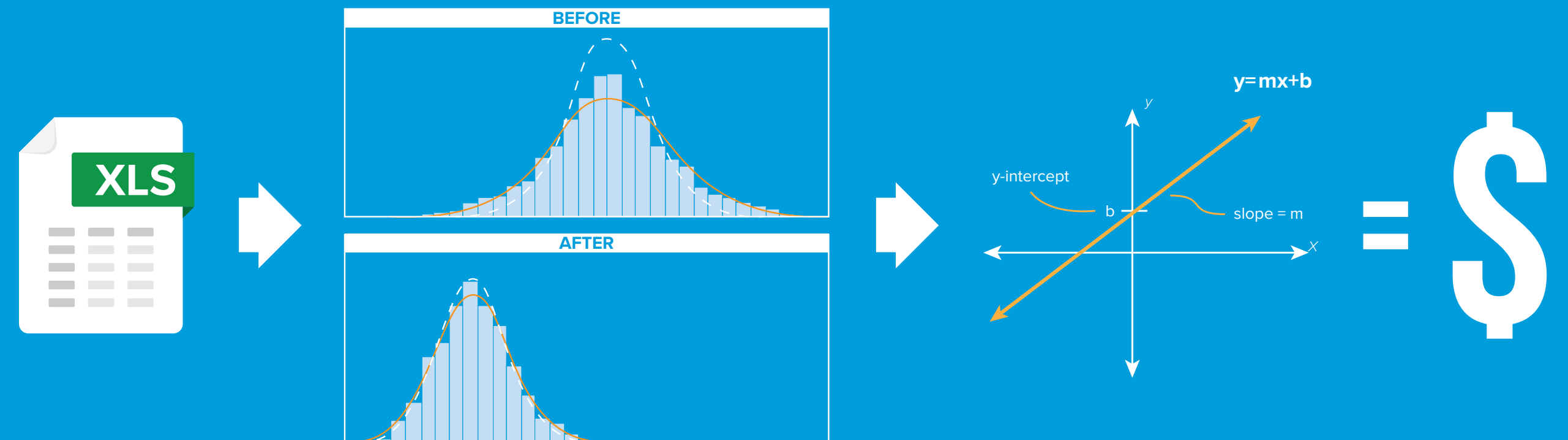
YouTube

precisionrollgrinders.com

PRG PROMISE TO PROVIDE VALUE

WE ARE COMMITTED TO HELPING
YOU REDUCE PROCESS VARIATION
AND INCREASE YOUR PROFITS!

- Any troubleshooting on rotational equipment (video, pics)
- Data analysis on current process
- Joint Design of Experiment to reduce variation



ADJUSTING TO OUR NEW “VIRTUAL” PARTNERSHIP

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CARROLLTON, GEORGIA

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LEWISPORT, KENTUCKY

(270) 295-4990

TEXARKANA, ARKANSAS

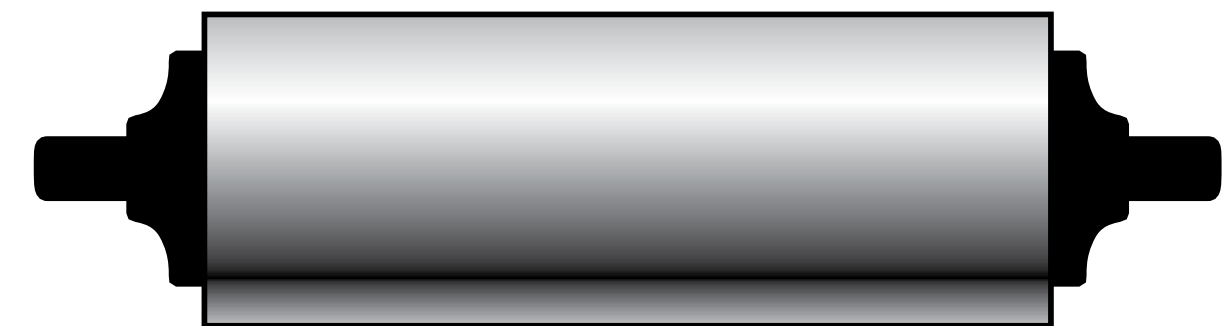
(870) 216-4000



THANK YOU FOR YOUR TIME.

QUESTIONS?

PRECISION



ROLL GRINDERS

Over 50 years of value-added service

precisionrollgrinders.com