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TECHNICAL GUIDES

Grizzly Feeder Bar Spacing: Optimize Scalping Efficiency for Maximum Crusher Protection

Set optimal grizzly feeder bar spacing for your crusher. Protect primary crusher while maximizing throughput with proper scalping configuration.

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Reading Time: 3 minutes

Grizzly feeder bar spacing determines how much material bypasses primary crushing—and optimal spacing can reduce crusher wear by 20-30% while increasing throughput 10-15%. Yet most plants run with original factory spacing regardless of their specific feed material and product requirements. This guide provides the engineering framework for optimizing scalping efficiency through proper bar spacing selection.

Grizzly Scalping Fundamentals

Purpose of Scalping

- Remove undersized material that doesn't need crushing
- Reduce crusher feed volume and wear
- Improve crusher efficiency through consistent feed

- Protect downstream equipment from surge feeding

Scalping Efficiency Formula

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Scalping Efficiency = (Undersized Removed / Total Undersized in Feed) × 100%

Target: >85% scalping efficiency for optimal crusher protection
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Bar Spacing Selection

Spacing Based on Crusher CSS

PRIMARY CRUSHER CSS	RECOMMENDED BAR SPACING	SCALPING TARGET
100mm	75-100mm	Remove -75mm material
125mm	100-125mm	Remove -100mm material
150mm	125-150mm	Remove -125mm material
175mm	150-175mm	Remove -150mm material

Design Rule

Bar spacing = 75-100% of crusher CSS

This ensures material passing through grizzly is larger than crusher's closed side setting and will be actually reduced in size.

Factors Affecting Optimal Spacing

FACTOR	EFFECT ON SPACING	RATIONALE
High fines in feed (>30% passing CSS)	Wider spacing acceptable	More material bypasses anyway
Low fines in feed (<15%)	Narrower spacing beneficial	Maximize bypass of undersized
Sticky/wet material	Wider spacing (25% larger)	Prevent bridging between bars

FACTOR	EFFECT ON SPACING	RATIONALE
Elongated particles	Consider slotted bars	Better throughput
High clay content	Wider spacing + self-cleaning	Prevent buildup

Bar Configuration Options

CONFIGURATION	APPLICATION	ADVANTAGES	LIMITATIONS
Parallel bars	Standard scalping	Simple, low cost	Can blind with elongated material
Stepped/cascade	High throughput	Better material flow	More complex
Finger bars	Sticky material	Self-cleaning action	Higher maintenance
Chain curtain	Extreme conditions	No blinding	Less precise sizing

Impact on Crusher Performance

Proper Spacing Benefits

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Example: 300 TPH feed with 25% passing 100mm CSS

Without Scalping:
- Crusher processes 300 TPH
- 75 TPH passes through without reduction
- Wasted energy: 75 × 0.8 kWh = 60 kWh

With Optimal Scalping (90% efficiency):
- Crusher processes 232.5 TPH
- Energy saved: 54 kWh (67.5 TPH × 0.8 kWh)
- Wear reduction: 25% less abrasive fines in chamber
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Cost Impact

PARAMETER	WITHOUT SCALPING	WITH OPTIMAL SCALPING	SAVINGS
Jaw liner life	150,000 tonnes	190,000 tonnes	27%
Power consumption	0.85 kWh/t	0.72 kWh/t	15%
Throughput capacity	280 TPH effective	315 TPH effective	12%

Maintenance Considerations

ITEM	INSPECTION	FREQUENCY	REPLACE WHEN
Bar wear	Measure cross-section	Monthly	>30% reduction
Bar spacing	Measure gaps	Monthly	>15% deviation from spec
Bar straightness	Visual + straightedge	Weekly	Visible bending
Mounting bolts	Torque check	Weekly	Any looseness

Conclusion

Grizzly bar spacing optimization is a low-cost, high-impact improvement that directly reduces crusher operating costs. Match spacing to your CSS, consider material characteristics, and monitor wear regularly. The 30-minute analysis and potential spacing adjustment yields benefits measured in lakhs of rupees annually through extended liner life and improved throughput efficiency.

Topics: #Feed System #Grizzly Feeder #Jaw Crusher #Scalping

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