

Shot Blasting Process Optimization & Cost Reduction

BAKUL CASTINGS PVT. LTD. | MANAGEMENT BRIEF

EXECUTIVE SUMMARY

With revised abrasive purchase prices of Rs. 60/kg for Cast Steel Shots and Rs. 105/kg for Cut Wire Shots (CWS), the financial comparison has been recalculated for the selected alternatives. Although CWS has a higher unit purchase price, its lower consumption, reduced breakdown, zero maintenance material cost and faster cleaning cycle produce a significantly lower operating cost. **CWS Grade II delivers estimated net monthly operational savings of Rs. 2,03,593/- per blasting line.**



OPERATIONAL & FINANCIAL COMPARISON

Performance & Cost Metrics

	Cast Shots BASELINE	CWS - Grade II RECOMMENDED
Purchase Price (per kg)	Rs. 60/-	Rs. 105/-
Monthly Consumption	5.0 MT	2.5 MT
Cleaning Cycle Time	20 - 30 mins	5 - 8 mins
Daily Cycle Capacity (Max)	58 cycles	240 cycles
Productivity Multiplier	1.00x	4.14x
Shots Breakdown Rate	20% / cycle	1% / cycle
Maintenance Material Expense	21%	0%
Operating Cost / Cycle (50 cycles/day)	Rs. 171/-	Rs. 36/-
Monthly Operating Cost (50 cycles/day)	Rs. 2,57,143/-	Rs. 53,550/-
Net Monthly Operational Savings	Baseline (Rs. 0)	Rs. 2,03,593/-

DETAILED COST SAVINGS DRIVERS

1. Lower Operating Cost per Cycle

The updated model reduces operating cost from Rs. 171/- to Rs. 36/- per cycle, an estimated reduction of Rs. 135/- per cycle. At 50 cycles per day, this is the principal contributor to the monthly saving.

2. Reduced Abrasive Consumption

Monthly abrasive consumption is reduced by 50%, from 5.0 MT to 2.5 MT. Even with the higher CWS unit price, the reduced quantity helps control the total abrasive requirement.

3. Breakdown & Maintenance Avoidance

Shot breakdown reduces from 20% to 1% per cycle, while maintenance material expense is reduced from 21% to 0%. These improvements reduce replacement, maintenance and downtime-related operating burden.

4. Annual Financial Impact

The estimated monthly operational saving of Rs. 2,03,593/- translates to approximately Rs. 24,43,116/- per year (Rs. 24.43 lakhs) for each machine line, before considering any additional value from increased production capacity.

STRATEGIC & OPERATIONAL IMPACT

Downtime & Maintenance Reduction

- Zero maintenance material cost for CWS Grade II.
- Maintenance labor involvement reduces from 15% to 6%.
- Shot breakdown reduces from 20% to 1% per cycle.

Productivity & Cost Leverage

- Cleaning capacity increases from 58 to up to 240 cycles/day.
- Productivity potential improves to 4.14x.
- Faster cycles can provide additional production value beyond the direct cost savings shown above.

PLANT MANAGEMENT RECOMMENDATION

With Grade I and Grade III removed from the comparison, **CWS Grade II is the recommended option** presented in this executive sheet. At the revised purchase prices, the updated model estimates a monthly operating cost of Rs. 53,550/-, compared with Rs. 2,57,143/- for Cast Steel Shots. This represents an estimated 79.2% reduction in monthly operating cost and a direct annual operational saving of approximately Rs. 24.43 lakhs per machine line. The financial benefit is further strengthened by lower abrasive consumption, minimal breakdown, elimination of maintenance material expense and the potential for 4.14x higher throughput.