



Separator Performance · Tromp Curve

Efficiency, cut size, bypass and sharpness from one sampling, with what to check first.

Licensed to: Sample file · worked example on a demonstration plant

1 YOUR SAMPLING

Plant / separator	Line 1 · high-efficiency separator
Sampling date	2026-09-20
Rotor speed (rpm)	820
Notes	Three samples taken together, 10:30

2 THE MILL AND ONE SIEVE

Fresh feed to the mill	120.00	t/h
Sieve used for the balance	45.00	µm
Residue · separator feed (mill discharge)	45.20	%
Residue · rejects (return to the mill)	68.40	%
Residue · fine product	6.10	%

3 FULL SIEVE ANALYSIS · cumulative residue %, coarsest sieve first

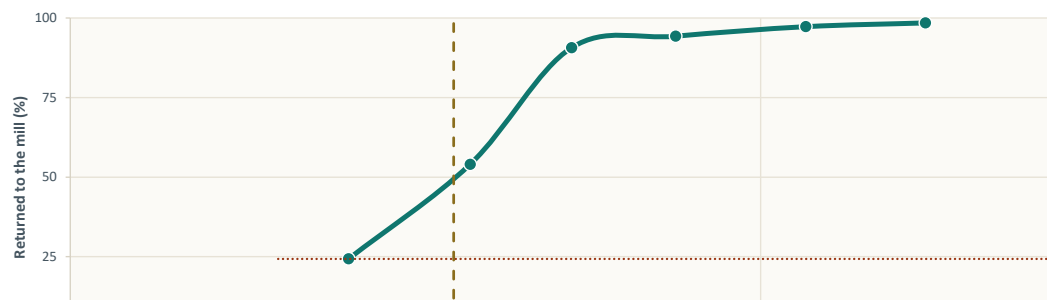
Sieve (µm)	Separator feed	Rejects	Product
200.00	3.80	6.00	0.10
150.00	8.90	14.00	0.30
90.00	21.16	33.00	1.20
63.00	32.81	50.50	3.00
45.00	45.20	68.40	6.10
32.00	54.03	76.00	17.00
20.00	64.36	80.00	38.00

Yellow cells are yours. Everything else is worked out as you type.

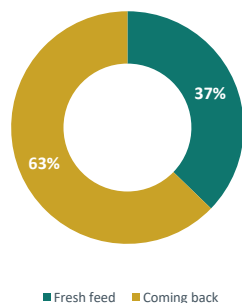
4 RESULTS

Fines recovery (efficiency) (%)	63.8	WATCH	Share of the fines reaching the separator that leave as product. A high-efficiency separator in good condition: 70 to 85 %.
Coarse returned to the mill (%)	95.0		Share of the coarse material the separator sends back, as it should.
Cut size d50 (µm)	35.9		The size the separator really splits at. Compare with the fineness being sold.
Bypass (%)	24.3	WATCH	Fines returned without classification. Watch above 15 %, act above 25 %.
Sharpness (imperfection)	0.286	GOOD	0.3 to 0.5 for a good high-efficiency separator; above 0.7 is blunt.
Circulating load (%)	168.5	GOOD	Usual for a closed circuit: 100 to 300 %.
Circulation factor C	2.685		Mill throughput divided by the fresh feed.
Material returned (t/h)	202.2		Rejects going back to the mill.
Total through the mill (t/h)	322.2		Fresh feed plus return: what the mill really handles.

Tromp curve · what goes back to the mill, size by size



What the mill handles



5 WHAT TO DO FIRST

GOOD

CIRCULATING LOAD

At 169 % the mill handles 322.2 t/h in total: 120 t/h of new material plus 202.2 t/h coming back.

Do: Compare that throughput with what the mill drive is pulling.

Why: Circulating load is what the mill really sees; the fresh feed alone says nothing about how hard it is working.

WATCH

FINES RECOVERY IS BELOW WHAT IT SHOULD BE

Of the material finer than 45 µm that reaches the separator, 63.8 % leaves as product; the rest goes back to the mill and is ground again. A high-efficiency separator in good condition recovers 70 to 85 %.

Do: Inspect the rotor and the guide vanes at the next stop, then repeat this sampling on the Before vs After sheet.

Why: Sampling before and after a repair is the only way to prove the repair paid off.

READ

WHERE IT REALLY CUTS

The curve crosses 50 % at 35.9 µm: the size the separator really splits at, whatever the speed setpoint says.

Do: Compare it with the fineness being sold, and note the rotor speed it belongs to.

Why: The cut size describes the separator honestly; the speed setpoint is only a request.

WATCH

FINES ARE BYPASSING

About 24.3 % of even the finest material is carried into the return without being classified: the flat tail at the left of the curve.

Do: Check the air distribution around the cage, look for a leaking rotor seal, and make sure the feed is spread evenly and not dumping on one side.

Why: Bypass is finished cement going round again: it costs power and adds nothing to the product.

GOOD

SHARPNESS OF THE CUT

An imperfection of 0.286 is sharp. A good high-efficiency separator sits around 0.3 to 0.5.

Do: Keep it as the reference and check it again after the next rotor inspection.



Before vs After · did the repair pay off?

The sampling on the first sheet is BEFORE. Enter the sampling taken after the change here.

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AFTER THE CHANGE

Fresh feed to the mill	128.00	t/h
Sieve used for the balance	45.00	μm
Residue · separator feed (mill discharge)	45.20	%
Residue · rejects (return to the mill)	72.00	%
Residue · fine product	5.20	%

Sieve (μm)	Separator feed	Rejects	Product
200.00	3.93	6.50	0.10
150.00	9.08	15.00	0.25
90.00	21.36	35.00	1.00
63.00	32.78	53.00	2.60
45.00	45.20	72.00	5.20
32.00	53.32	79.00	15.00
20.00	63.84	82.50	36.00

WHAT CHANGED

	Before	After	Change	Verdict
Fines recovery (%)	63.8	69.4	5.6	BETTER
Coarse returned (%)	95.0	95.4	0.4	SAME
Cut size d50 (μm)	35.9	37.2	1.2	HIGHER
Bypass (%)	24.3	19.9	-4.4	BETTER
Sharpness (imperfection)	0.3	0.3	0.0	BETTER
Circulating load (%)	168.5	149.3	-19.3	LOWER
Fresh feed (t/h)	120.0	128.0	8.0	BETTER

The two Tromp curves

