Achieve up to 40% higher capacity with higher efficiency and within the same footprint of an existing screen. WE CAN PROVE IT!

TECHNICAL STUDY: Lab Testing

GK MINING SCREEN TEST CIRCUIT

*Screen Testing Lab located in Crystal Lake, Illinois, USA, has conducted tests on actual customer material from Europe, China, Japan, Australia & South America

Replicates Actual Process Conditions of A Customer's SAG, AG, HPGR or Crusher Circuit

KEY ELEMENTS:

Belt Feeder to meter in customer material to replicate actual bed depth and equivalent volume as their process screen

Test Screen with ± 3000 mm length by 300 mm width screening area. Overs from the screen are recirculated 3-5 times which enables scale up to 4.8M Wide by 12M Long STM Single Deck or Dual Deck STM Screens.

Metered Water Manifold and Spray Bars (wet screening) to achieve equivalent material to water ratios of material slurry entering the screen and water sprayed along the length of the screen surface

Testing Lab Equipment Ro-Tap Sieves, Drying Oven and Weigh Scales to analyze and document each passing of material over the test screen for PSD, Screening Efficiency & % Moisture

LAB SCREEN SET-UP OPTIONS:

- **Angle of Incline:** Flat to 20+ degrees
- **Angle of Throw:** 35 to 55 degrees
- **RPM:** 500 to 1000
- **Stroke:** 3mm to 12.5mm
- **Material Rate of Speed (Screening Time):** 0.2 to 0.5 M/s

Typical Sample Run – Wet Screening

Run No	Feed Wt, Lbs	Transfer Time, secs	Gross Wet Wt, gm	Tare Wt, gm	Gross Dry Wt, gm	A Wt Wet to Dry, gm	MCWB	Overs Wet Wt, Lbs	Overs Dry Wt, Lbs	Weight Removed, Lbs	Decimal % Unders Removed	Cummulative Decimal % Unders Removed	No of Passes	Cummulative Length of Screen Deck, FT	Cummulative Length of Screen Deck, M	Feed Rate, TPH	No of Pebbles Retained	Feed Time Surge Factor	Feed Rate Surge Factor	Surge Factor, Rate * Time	Time for Rock to Travel 9.5 FT, secs	Rock in Bed Cs, FPM	Time on Screen Deck, secs	Cummulative Time on Screen Deck, secs	No of Passes	Tare Wt. Overs (Gm)	Gross Wt. Overs (Gm)	Dry Wt. Overs (Gm)	Minus 4mm Wt. in Overs (Gm)	%-4m	% Efficiency Based on %-4mm in overs	MCWB Overs

Test No X- (Aperture size Screening wet) XX.X° incline

- Vibratory test screen has X mm x X mm slotted aperture panels.
- Metering Belt Feeder provides designed capacity to the test screen at a scaled ratio to the designed width of the existing screen.
- “Unders” from the XX mm screening test prior is used for this test.
- The design capacity for the lab scale vibratory screen area computed using the following scale factor with the stated PSD of XX% passing X mm = XXX MTPH * XX% * 1.1 * XX” test screen width / XX” design screen width = XX.X STPH
- Water is added creating a mixing box condition prior to entry of material onto the test screen. Slurry to be the same composition of water and crushed ore as at the mine. This only occurs on Run 1. See Fig 1
- The Ratio of Mixing Box water added is based on the following ratio: XXX m³/hr./ XXX MTPH= X.XXX
- The spray water added to the lower deck (XX mm aperture) is calculated based on the following criteria:
  - The amount of spray water on the top deck is considered water for washing on the lower deck as well.
  - Assumption of a conservative reduction of XX% of the spray water from the upper deck will not be applied to the lower deck
  - Spray water on the upper deck is designed at a rate of XX m³/hr.* XX% = XX m³/hr.
  - Spray water on the lower deck is designed at a rate of XX m³/hr.
  - Therefore, the total spray water on the lower deck was designed at = XX + XX = XX m³/hr.
  - This equate to XX m³/hr.* 4.4029*XX”/XX” = X.X GPM
  - The spray water is added to the first 3 runs with the last nozzle spraying approximately X’ from the discharge end. See Fig 2
  - All the nozzles were angled at XX° from horizontal
  - A total of X (X mm) orifice nozzles are used for the test
- Product is screened at a 10-foot screen length to remove the +X mm.
- Screen operates at a XX.X° incline, XXX RPM and constant vibration acceleration under load of XX” stroke.
- Material retention time across the test screen is approximately ~x seconds per run.
- Sequential runs of 0-10, 10-20, 20-30, 30-40 & 40-50 feet of screening are completed.
- “Overs” from the test screen for each 10-foot run are collected and weighed.

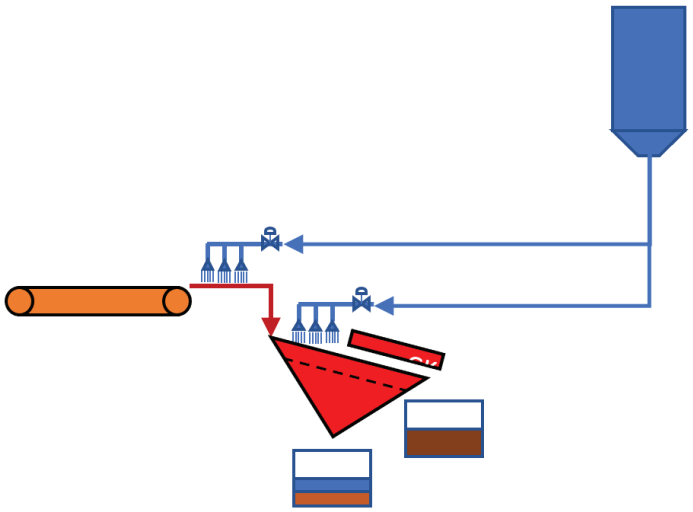


Fig 1: Run 1

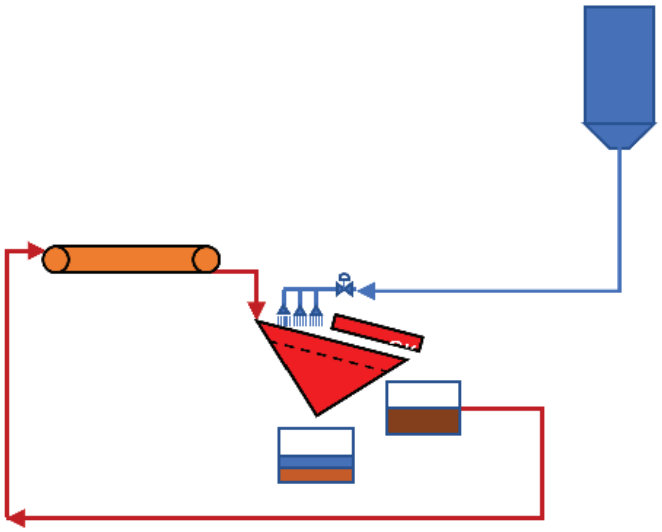
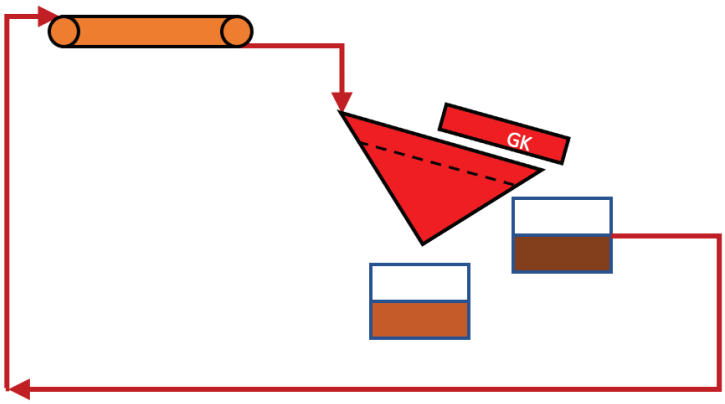


Fig 2: Run 2 & 3

Typical Sample Run – Dry Screening

Run No	Feed Wt, Lbs	Transfer Time, secs	Overs Wt, Lbs	Weight Removed , Lbs	Decimal % Unders Removed	Cumulative Decimal % Unders Removed	No of Passes	Cumulative Length of Screen Deck, FT	Cumulative Length of Screen Deck, M	Decimal % Unders	Cumulative Decimal % Unders Removed	Feed Rate, TPH	No of Pebbles Retained	Feed Time Surge Factor	Feed Rate Surge Factor	Surge Factor, Rate * Time	Time for Rock to Travel 8.25 FT, secs	Rock in Bed Cs, FPM	Time on Screen Deck, secs	Cumulative Time on Screen Deck, secs



Test No Y– (YY mm x YY mm Screening dry)

- Sample drums Y & Y received are mixed individually and a PSD taken for each batch.
- Each batch is tested individually twice to confirm repeatable results.
- The second test for each batch involves reconstitution of the material.
- Metering Belt Feeder provides a designed capacity to the test screen at a scaled ratio to the designed width of the existing screen.
- The design capacity for the lab scale vibratory screen is computed with the following scale factor of = YYY MTPH * 1.1 * YY" test screen width/YY" design screen width = YY STPH
- Vibratory test screen has YY mm x YY mm slotted aperture panels.
- Product is screened on a 10 feet screen length to remove the +YY mm.
- Screen operated at a YY° incline, YYY RPM and constant vibration acceleration under load of YYY" stroke.
- Material retention time across the test screen is approximately ~Y seconds per run.
- Sequential runs of 0-10, 10-20 & 20-30 feet of screening are completed.
- "Overs" from the test screen for each 10-foot run are collected and weighed.

Example of Collected Data Set

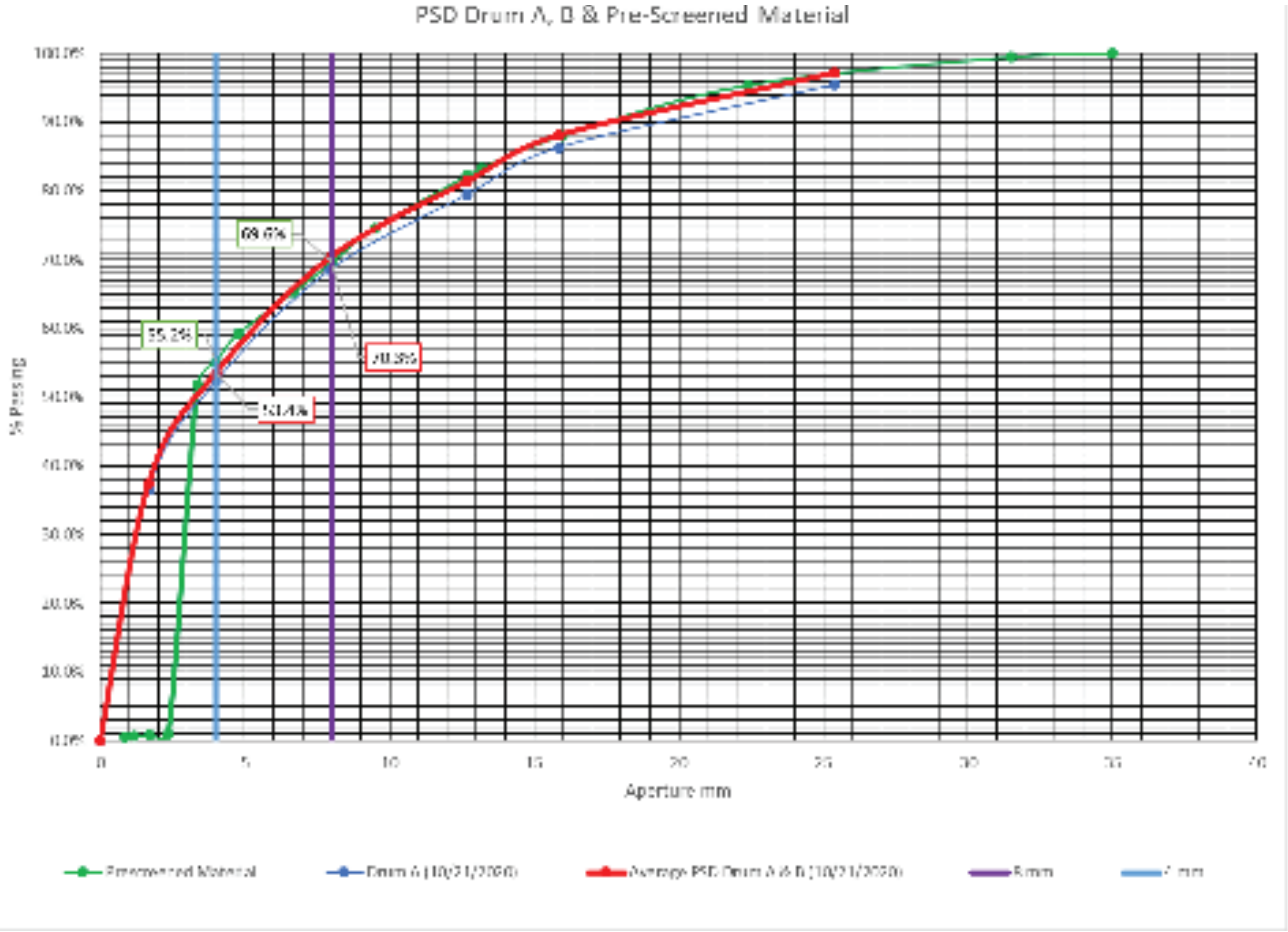
Run No	Feed Wt, Lbs	Transfer Time, secs	Gross Wet Wt, gm	Tare Wt, gm	Gross Dry Wt, gm	Δ Wt Wet to Dry, gm	MCWB	Overs Wet Wt, Lbs	Overs Dry Wt, Lbs	Weight Removed, Lbs	Decimal % Unders Removed	Cummulative Decimal % Unders Removed
7-1	601	21.5	645.3	47.8	622.7	22.6	3.8%	310	298	302.7	0.6317	0.6317
7-2	298	21.0	1,026.7	47.1	985.3	41.4	4.2%	207	198	100.0	0.2087	0.8405
7-3	198	21.0	983.1	45.6	943.6	39.5	4.2%	163	156	42.1	0.0879	0.9284
7-4	156	21.0	624.2	46.7	612.4	11.8	2.0%	139	136	20.0	0.0417	0.9700
7-5	136	21.0	1,111.9	46.1	1,093.0	18.9	1.8%	124	122	14.4	0.0300	1.0000
									Σ	479.2		
									Wt Unders	445		

No of Passes	Cummulative Length of Screen Deck, FT	Cummulative Length of Screen Deck, M	Feed Rate, TPH	No of Pebbles Received	Feed Time Surge Factor	Feed Rate Surge Factor	Surge Factor, Rate * Time	Time for Rock to Travel 9.5 FT, secs	Rock in Bed Ct, FPM	Time on Screen Deck, secs	Cummulative Time on Screen Deck, secs	No of Passes	Tare Wt. Overs (Gm)	Gross Wt. Overs (Gm)	Dry Wt. Overs (Gm)	Minus 4mm Wt. In Overs (Gm)	%-4m	% Efficiency Based on %-4mm in overs	MCWB Overs
1	0.58	2.82	30.3		1.00	0.88	0.88	4.57	168.3	3.26	3.26	1	47.80	645.30	622.70	80.50	10.51%	88.1%	3.8%
2	10.17	5.84			1.00		1.00	6.57	73.3	7.57	10.83	2	47.10	1,026.70	985.30	134.80	14.37%	98.8%	4.2%
3	28.79	8.79			1.00		1.00	8.01	62.4	9.92	20.75	3	45.60	983.10	943.60	98.70	12.09%	98.2%	4.2%
4	48.33	11.80		No significant pegging	1.00		1.00	9.86	62.6	9.51	29.26	4	46.70	624.20	612.40	31.10	7.03%	99.4%	2.0%
5	47.92	14.60			1.00		1.00	9.50	63.0	9.33	38.59	5	46.10	1,111.90	1,093.00	9.60	0.94%	99.7%	1.8%
					Surge Factor, S		1.00												

Calculation Based on PSD		
PSD Drum B+4 mm		92.0%
Available +4 mm		498.0
Efficiency	2-1	66%
Efficiency	3-2	86%
Efficiency	4-3	98%
Efficiency	5-4	102%
Efficiency	7-5	100%

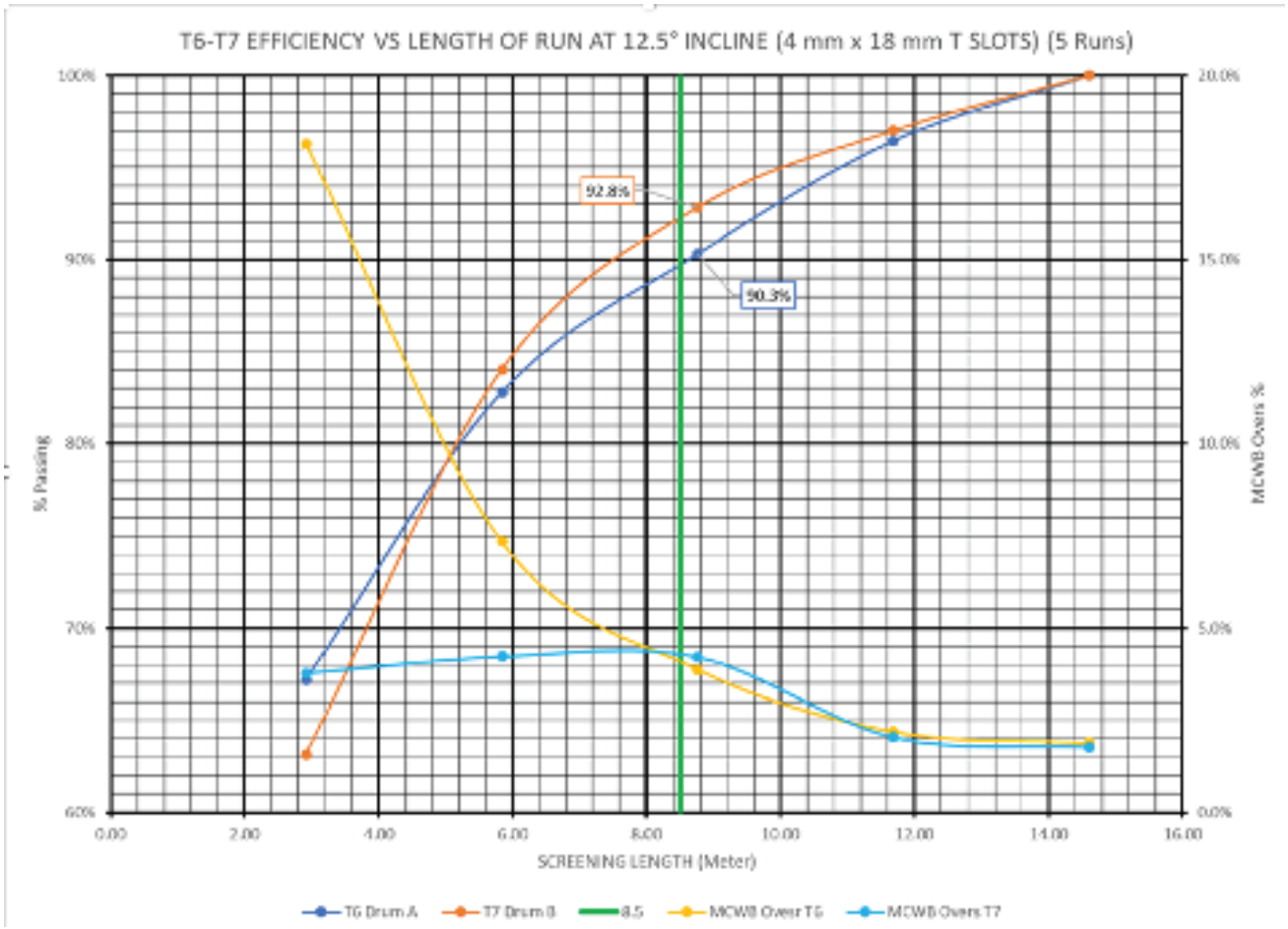
*A typical sample run takes ~2 hours to complete the multiple screen runs, collect data and conduct lab testing of collected samples

Examples of PSD and Test Run Curves

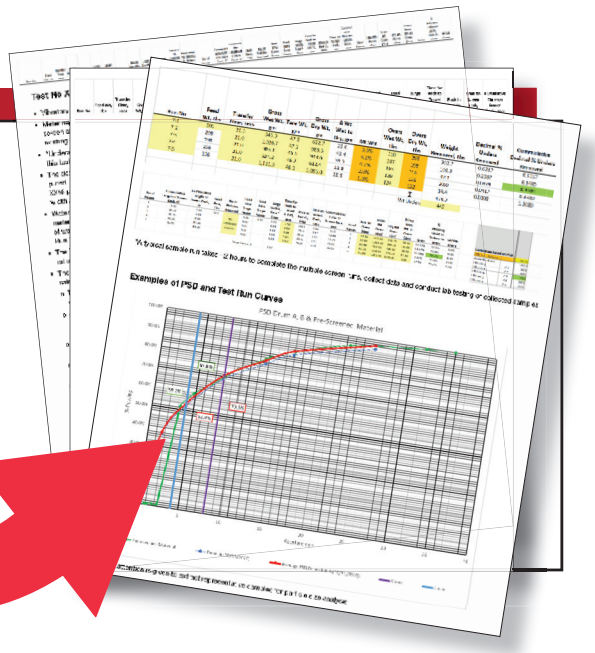


*Proper attention is given to extract representative samples for particle size analysis

Examples of PSD and Test Run Curves (continued)



**Blue & orange lines represent the screening efficiency from 2 separate samples. Yellow & teal lines represent the "Overs" moisture



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3. Receive your personalized test results!

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