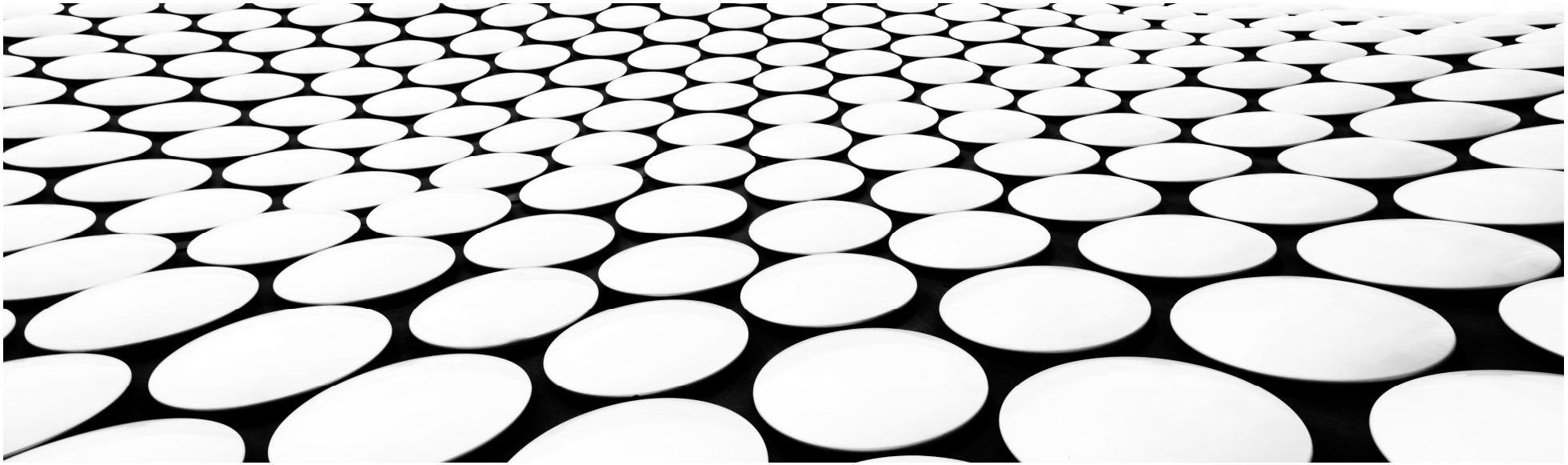
SCREEN MEDIA SOLUTIONS FOR SAND & AGGREGATE MINING
VTCA - 2025



TOPICS

What Affects Screening Efficiency

Types of Screen Media

Strategic Application

WHAT AFFECTS SCREENING EFFICIENCY

- Blasting *(Pattern, Sub-Drill, PF, etc.)*
- Deposit Consistency/Inconsistency *(Dredging, etc.)*
- Crushers *(Wear parts, settings, etc.)*
- Feed Gradations *(PSDs)*
- Feed Distribution & Depth of Bed
- Material Type *(Clay & Sticky Materials)*
- Moisture Content
- Water Management *(Wet Screening)*
- Screening Equipment *(Vibratory, static, etc.)*
- Equipment *(Peak Efficiency, Throughput & Energy)*
- Media Selection
- “Effectual” Open Area

IMPORTANCE OF FEED GRADATIONS

IMPORTANCE OF FEED GRADATIONS

River Sand

Pit Sand

M-Sand

Sea Sand

Silty Sand

Artificial/
Recycled Sand

IMPORTANCE OF FEED GRADATIONS

Near-size material concentration - When feed contains high percentages of particles close to the screen opening size (typically within 25% of the aperture), efficiency drops significantly as these "near-size" particles require more time and opportunity to pass through, often blinding or pegging the openings.

Fine particle content and moisture - Excessive fines (particularly minus 100-mesh material) combine with moisture to create adhesive forces that cause agglomeration, block screen openings, and reduce the effective screening area, dramatically decreasing efficiency, especially in wet screening applications.

Top size to opening ratio - Feed containing particles larger than 3-4 times the screen opening size can cause impact damage and premature wear while also creating a "trampoline effect" that prevents proper stratification of smaller particles, reducing their chance to reach and pass through the openings.

Distribution uniformity - Uneven particle size distribution or segregated feed creates localized overloading on certain screen areas, leading to reduced retention time and inadequate screening in those zones while underutilizing other areas of the screen surface.

Particle shape factors - Elongated or flat particles (common in crushed materials versus natural sand) orient themselves poorly relative to screen openings, requiring more attempts to pass through compared to cubical particles, thereby reducing overall efficiency.

Feed rate stability - Fluctuating gradations cause inconsistent bed depths on the screen deck, with thin beds reducing particle-to-particle agitation needed for stratification, while thick beds increase the number of layers particles must migrate through to reach the screen surface.

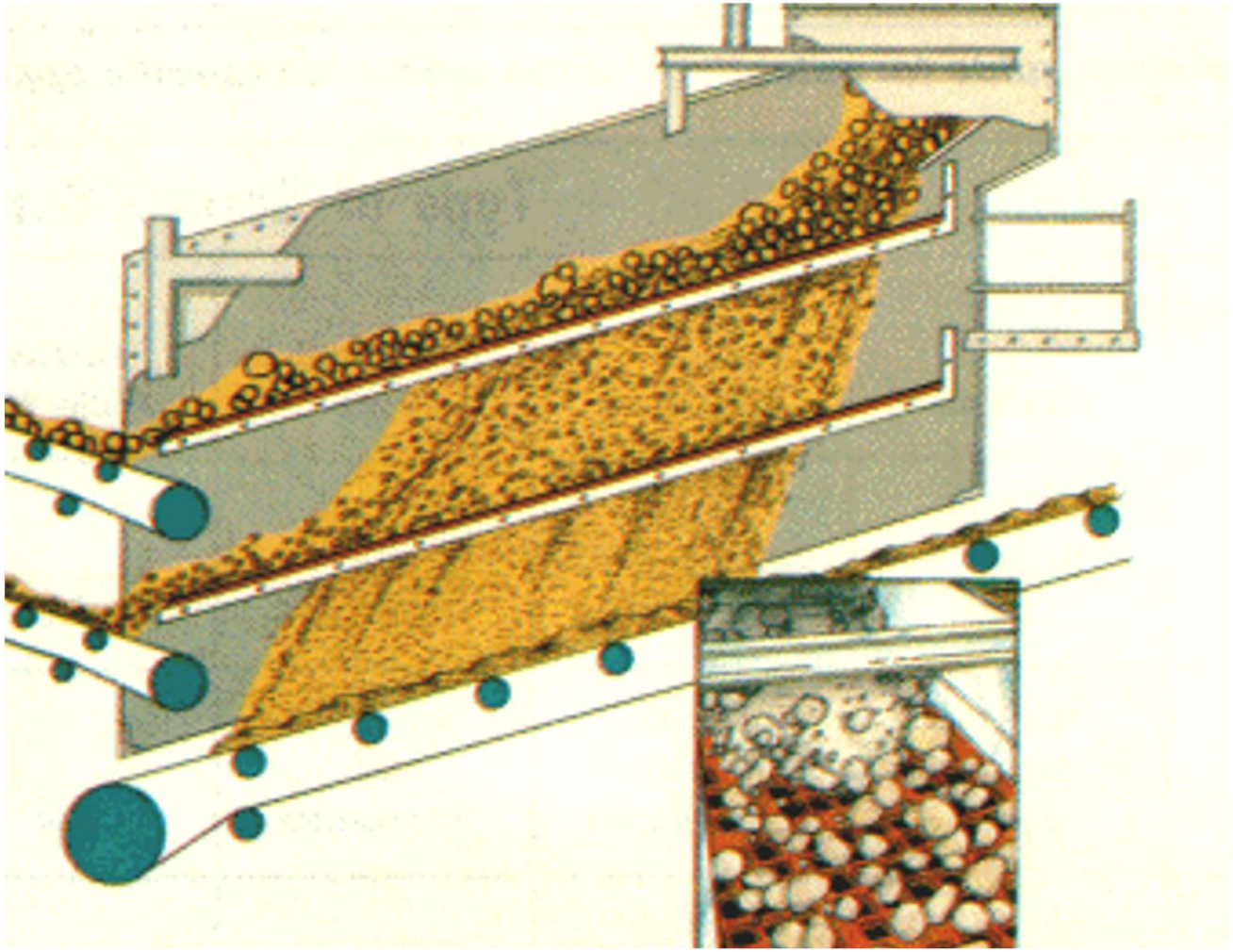
Cut point precision - A narrow gradation range around the desired separation size allows for optimized screen selection and operating parameters, while extremely wide gradations force compromises in screen specification that reduce efficiency at both the coarse and fine ends of the spectrum.

IMPROPER FEED

INADEQUATE WATER

PROPER FEED ARRANGEMENT

- The material must be screened out as soon as possible on the top deck to get full utilization of the decks below.



THE EFFECT OF WATER ON CAPACITY

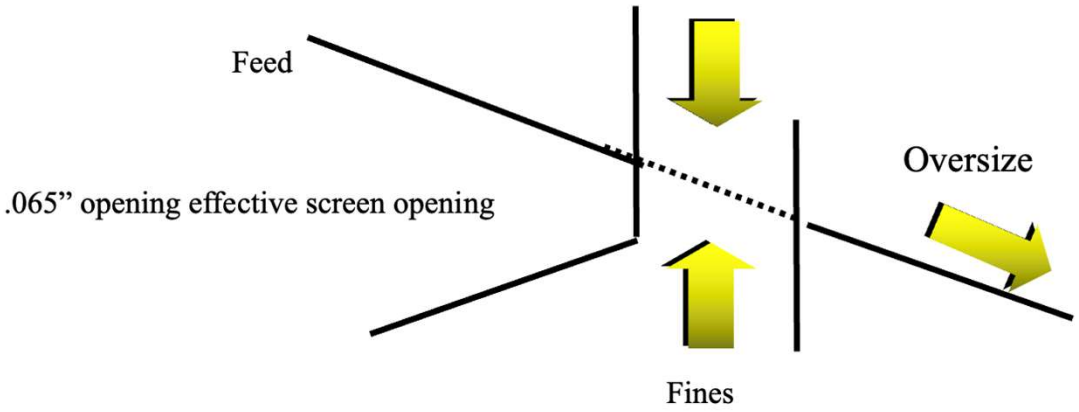
Size of Opening	Factor E
1/32"	1.25
1/16"	1.75
1/8"	2.00
3/16"	2.00
5/16"	1.75
3/8"	1.50
1/2"	1.30
3/4"	1.20
1"	1.10

1" = 10% Increase
3/16" = 100% Increase
Finer cuts benefit more from water.

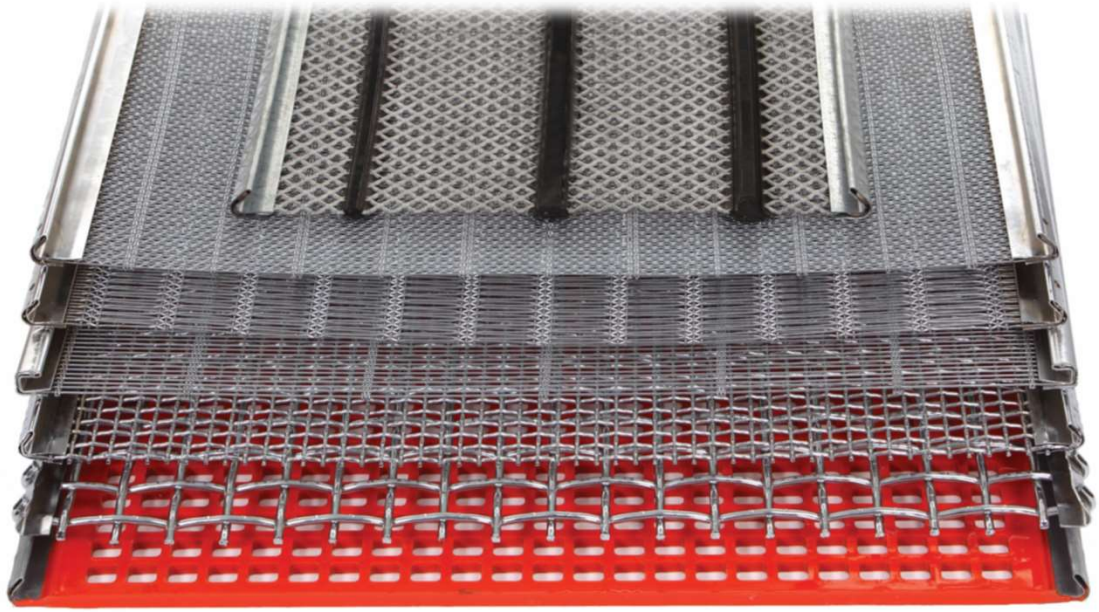
TYPES OF SCREEN MEDIA & COMPOUNDS

- Woven Wire Cloth *(Side Tension & Modular)*
- Hybrid Wire *(Side Tension & Modular)*
- Welded Wire *(Side Tension & Modular)*
- Profile Wire *(Bolt Down, Side Tension, & Modular)*
- Perforated Plate *(Bolt Down, Side Tension, & Modular)*
- Rubber *(Bolt Down, Side Tension, & Modular)*
- Polyurethane *(Side Tension & Modular)*

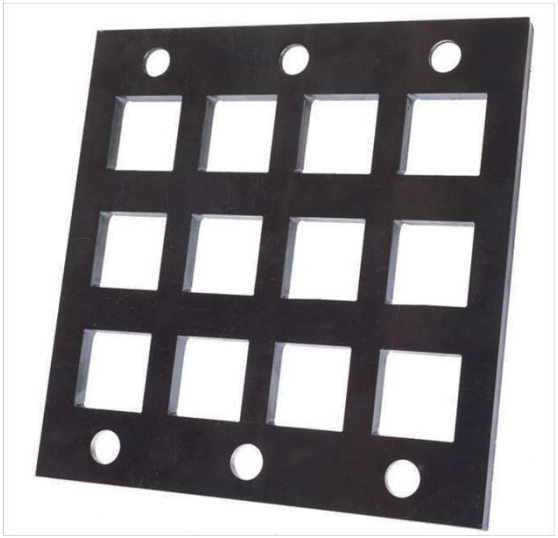
.079” opening calculated for 35-degree angle

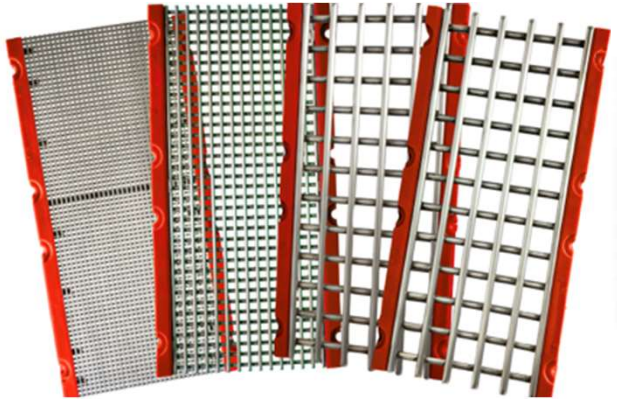


Angle	Cosine
18	.9511
20	.9397
21	.9336
22	9272
23	.9205
24	.9135
25	.9063
26	.8988
27	.8910
28	.8829
29	.8746
30	.8660
31	.8571
32	.8480

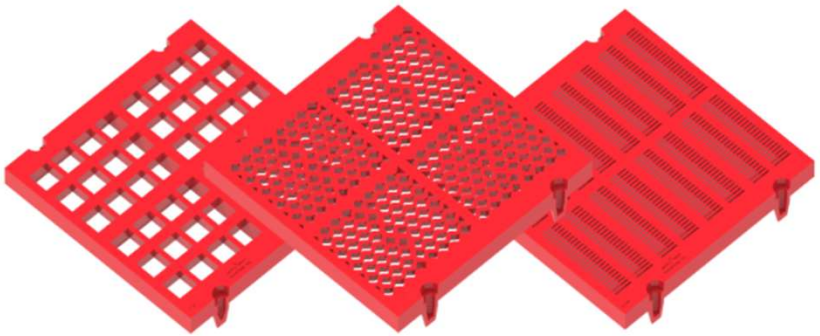


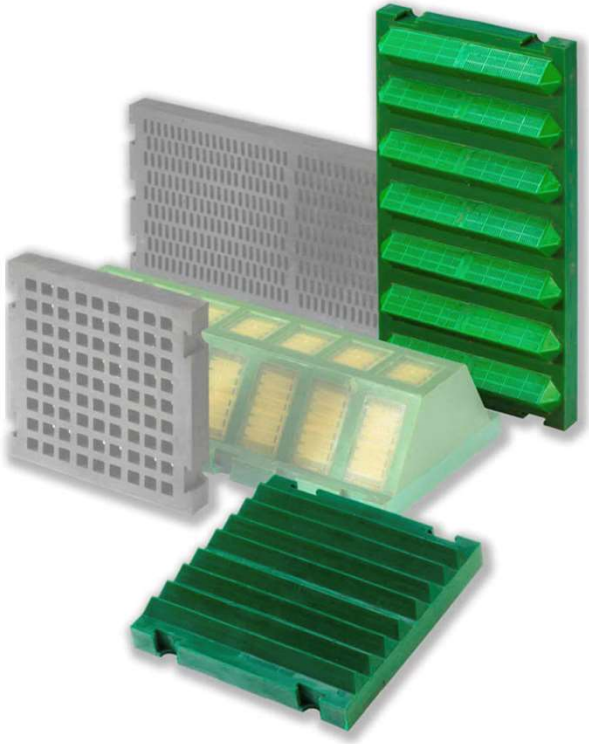
TYPES OF SCREEN MEDIA





TYPES OF SCREEN MEDIA





TYPES OF SCREEN MEDIA

NOTE: Synthetic Media Can Reduce dB by 50% to the human ear.
110dB reduced to 96dB

OPEN AREA IS CRUCIAL

Square Opening Wire Cloth

Opening Inches	Opening Mesh	Opening Millimeters	Wire Diameter	Wire Gauge	Percent Open Area	Weight Lbs./Sq.Ft.
3/8	0.375	9.6150	0.080	14	67.9%	0.91
			0.092	13	64.5%	1.18
			0.105	12	61.0%	1.51
			0.120	11	57.4%	1.92
			0.135	10	54.1%	2.37
			0.148	9	51.4%	2.79
			0.162	8	48.7%	3.27
			0.177	7	46.1%	3.82
			0.192	6	43.8%	4.39
			0.207	5	41.3%	5.00
			0.225	4	39.0%	5.77
7/16	0.438	11.2179	0.105	12	65.0%	1.33
			0.120	11	61.5%	1.69
			0.135	10	58.4%	2.09
			0.148	9	55.8%	2.47
			0.162	8	53.2%	2.90
			0.177	7	50.7%	3.40
			0.192	6	48.3%	3.92
			0.207	5	46.0%	4.47
			0.225	4	43.6%	5.16
1/2	0.500	12.821	0.063	16	78.9%	0.45
			0.072	15	76.4%	0.58
			0.080	14	74.3%	0.71
			0.092	13	71.3%	0.93
			0.105	12	68.3%	1.18
			0.120	11	65.0%	1.51
			0.135	10	62.0%	1.88
			0.148	9	59.5%	2.22
			0.162	8	57.1%	2.61
			0.177	7	54.5%	3.06
			0.192	6	52.2%	3.54
			0.207	5	49.8%	4.04
			0.225	4	47.3%	4.68
			0.250		44.4%	5.62
9/16	0.563	14.4230	0.092	13	73.3%	0.83
			0.105	12	71.1%	1.08
			0.120	11	68.1%	1.38
			0.135	10	65.1%	1.70
			0.148	9	62.6%	2.12
			0.162	8	61.0%	2.37
			0.177	7	57.6%	2.79
			0.192	6	55.0%	3.24
			0.207	5	53.4%	3.69
			0.225	4	50.7%	4.29
			0.250		47.9%	5.15

22%

23.9%

23.2%

Square Opening Wire Cloth

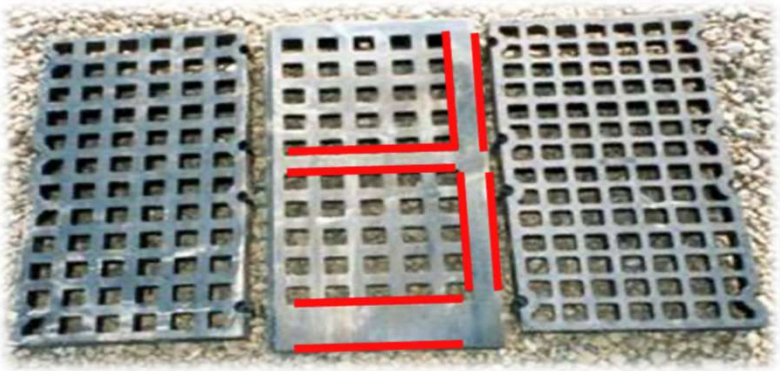
Opening Inches	Opening Mesh	Opening Millimeters	Wire Diameter	Wire Gauge	Percent Open Area	Weight Lbs./Sq.Ft.
5/8	0.625	16.0256	0.105	12	73.4%	0.98
			0.120	11	70.3%	1.25
			0.135	10	67.6%	1.56
			0.148	9	65.4%	1.85
			0.162	8	63.1%	2.18
			0.177	7	60.7%	2.56
			0.192	6	58.5%	2.97
			0.207	5	56.4%	3.40
			0.225	4	54.0%	3.94
			0.250		51.0%	4.76
			0.313		44.4%	7.03
3/4	0.750	19.2307	0.120	11	74.3%	1.07
			0.135	10	71.8%	1.33
			0.148	9	69.8%	1.58
			0.162	8	67.6%	1.87
			0.177	7	65.5%	2.20
			0.192	6	63.4%	2.56
			0.207	5	61.4%	2.93
			0.225	4	59.2%	3.41
			0.250		56.3%	4.12
			0.313		49.8%	6.13
			0.375		44.4%	8.44
7/8	0.875	22.436	0.135	10	75.1%	1.17
			0.148	9	73.5%	1.38
			0.162	8	71.2%	1.64
			0.177	7	69.2%	1.93
			0.192	6	67.2%	2.25
			0.207	5	65.3%	2.58
			0.225	4	63.3%	3.01
			0.250		60.5%	3.64
			0.313		54.3%	5.44
			0.375		49.0%	7.52
1	1.000	25.4000	0.135	10	77.6%	1.04
			0.148	9	75.9%	1.23
			0.162	8	74.0%	1.46
			0.177	7	72.2%	1.72
			0.192	6	70.4%	2.01
			0.207	5	68.6%	2.31
			0.225	4	66.6%	2.69
			0.250		64.0%	3.26
			0.313		58.0%	4.90
			0.375		52.9%	6.79
1 1/8	1.125	28.6050	0.162	8	76.4%	1.32
			0.177	7	74.7%	1.55
			0.192	6	73.0%	1.81
			0.207	5	71.3%	2.08
			0.225	4	69.4%	2.43
			0.250		66.9%	2.96
			0.313		61.2%	4.45
			0.375		56.3%	6.19

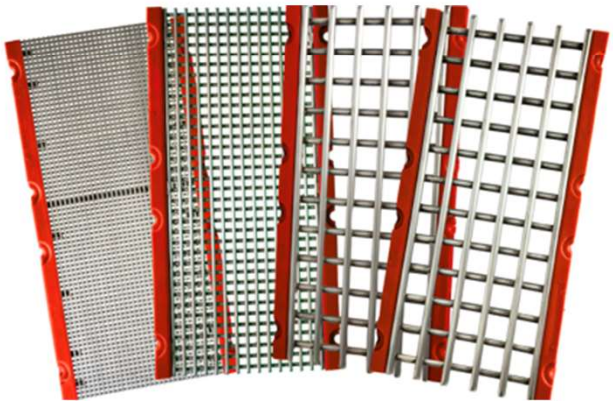
22%

24.7%

STRATEGIC APPLICATION

Balance between efficiency and wear life.





STRATEGIC APPLICATION

Media Selection:

Deck 1:
1” (27mm)
Modular Rubber 1’ x 2’
40mm thick.
36.4% open area.

Deck 2:
11/16”(17.5mm)
Modular Rubber 1’ x 2’
40mm thick.
28.9% open area.

Deck 3:
1/2”(12.7mm)
Modular Rubber 1’ x 2’
40mm thick.
39.0% open area.

SNX305

3 Deck Inclined Screen Generic

Grading	% Pass	% Ret.	TPH
1.26	100.0	0	0
0.984	98.0	2.0	10.7
0.866	95.0	3.0	16.1
0.748	92.0	3.0	16.1
0.63	80.0	12.0	64.3
0.512	66.0	14.0	75.0
0.394	55.0	11.0	58.9
#2 1/2	45.0	10.0	53.6
0.236	36.0	9.0	48.2
#5	26.0	10.0	53.6
#10	13.0	13.0	69.6
0	0.0	13.0	69.6
Total	- -	100.0	536

	Deck 1	Deck 2	Deck 3
Size	8x24	8x24	8x24
Cut Size(inches)	1	5/8	1/2
Type	mesh	mesh	mesh
Calculation method	VSMA	VSMA	VSMA
Carry-over method	Near-size	Near-size	Near-size
Basic Capacity (tph/ft^2)	3.56	2.82	2.47
Half Size Factor	1.55	1.14	1.21
Oversize Factor	1.25	1.04	1.06
Deck Factor	1.0	0.9	0.8
Efficiency	95	93	95
Efficiency Factor	1.0	1.06	1.0
Use spray	No	No	No
Wet Factor	1.0	1.0	1.0
Open Area %	41.0	40.0	39.0
Open Area Factor	0.64	0.68	0.72
Slot Type	square	square	square
Slot Factor	1.0	1.0	1.0
Weight Factor	1.0	1.0	1.0
	1.0	1.0	1.0
Actual Capacity (tph/ft^2)	4.41	2.16	1.83
Rate (fpm)	75.0	75.0	75.0
Spray Rate (gpm)	0.0	0.0	0.0
DBD Ratio	0.2	1.3	1.0
Power:(kW)	0	0	0
TPH onto Deck	536	500	381
TPH off Deck	36	119	78
TPH through Deck	500	381	303
Required Area (ft^2)	119.1	189.7	174.7
Available Area (ft^2)	192.0	192.0	192.0

- 4.6% Open Area

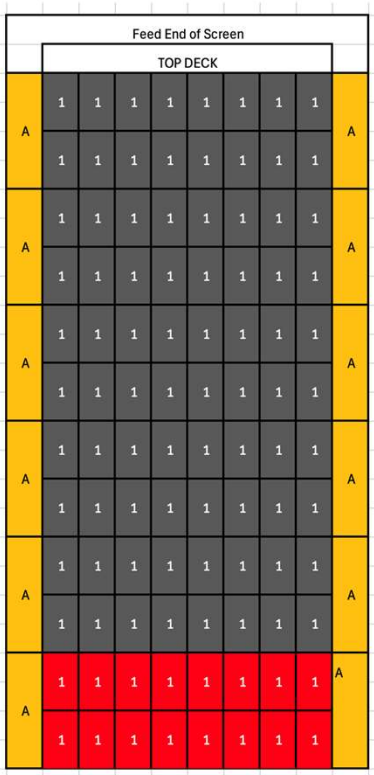
- 11.1% Open Area

Mode: No Ballast

STRATEGIC APPLICATION

Balance between efficiency and wear life.

Required = 41%
Actual = 41%



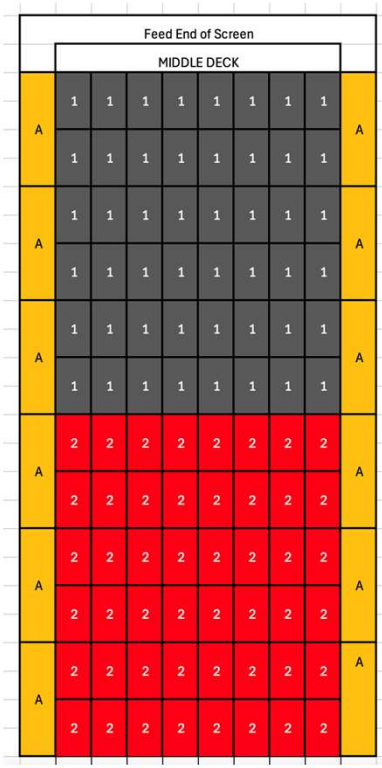
BOTTOM DECK MEDIA			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	80	TBA	27mm (1") Rubber 1' x 2' 40mm thick; 36.4% Open Area
2	16	TBA	25.4mm(1") Tuff-Wire; 0.250 wire - 1' x 2' Tuff-Wire; 64% Open Area
A	12	TBA	Side Wear Plates

TOTAL DECK OPEN AREA 41%

STRATEGIC APPLICATION

Balance between efficiency and wear life.

Required = 40%
Actual = 39.9%

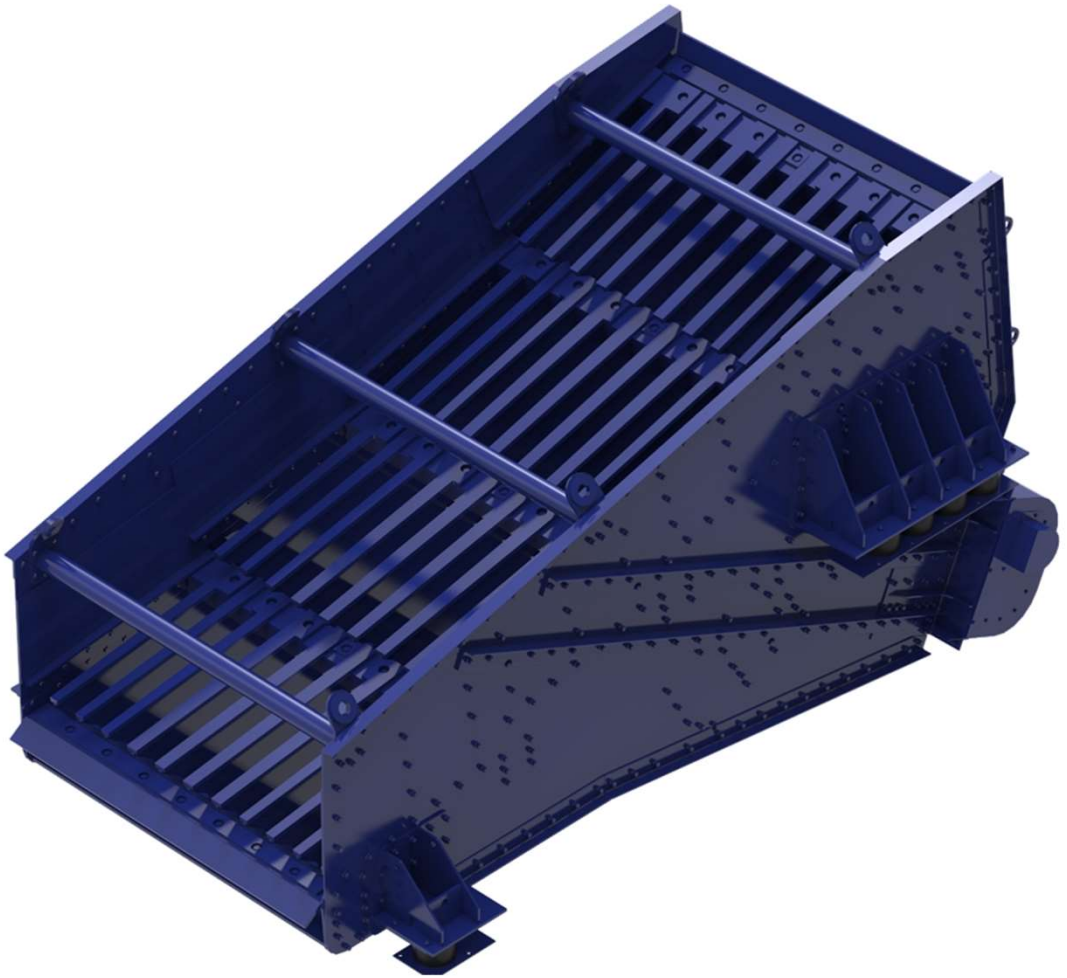


MIDDLE DECK MEDIA			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	48	TBA	17.5mm (11/16") Rubber 1' x 2' 40mm thick; 28.9% Open Area
2	48	TBA	16mm(5/8") Tuff-Wire; 0.250 wire - 1' x 2' Tuff-Wire; 51% Open Area
A	12	TBA	Side Wear Plates

TOTAL DECK OPEN AREA = 39.9%

STRATEGIC APPLICATION

Media Selection - Scalping Applications

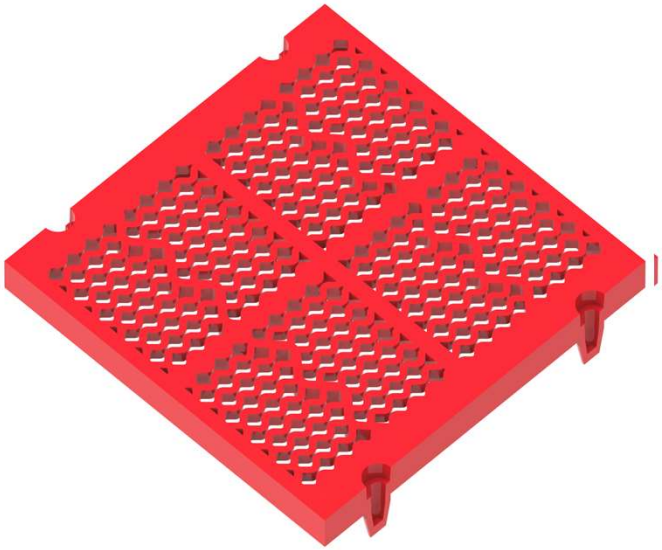


STRATEGIC APPLICATION

Media Selection - Scalping Applications

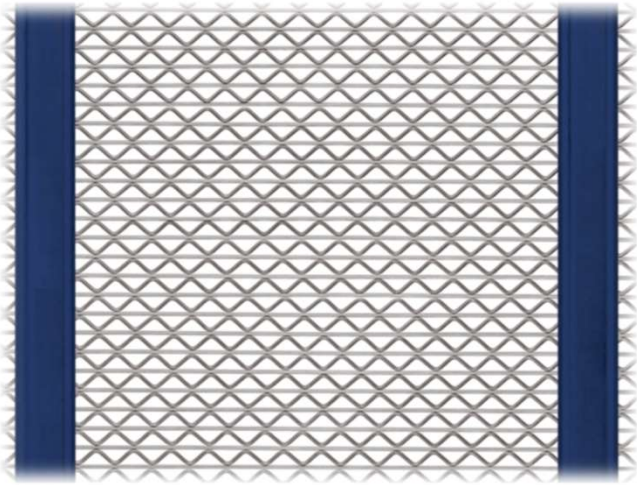
STRATEGIC APPLICATION

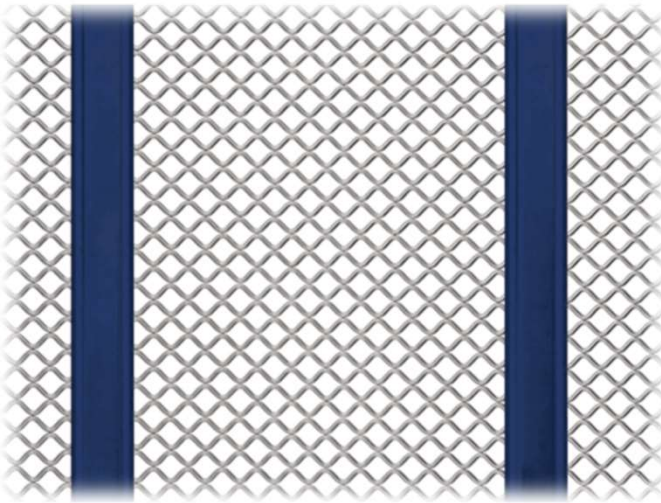
Media Selection – Plugging Applications



STRATEGIC APPLICATION

Media Selection – Blinding Applications

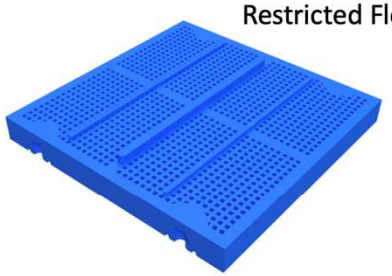




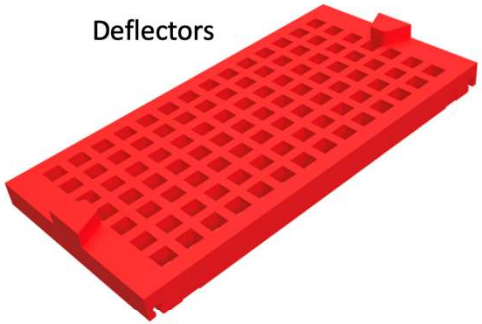
STRATEGIC APPLICATION

Media Selection – Wet Sizing

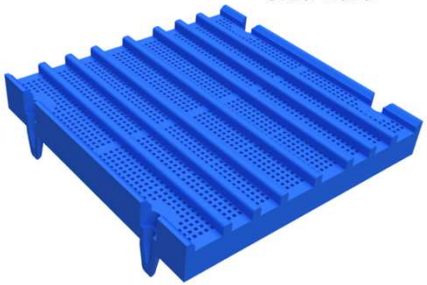
Restricted Flow



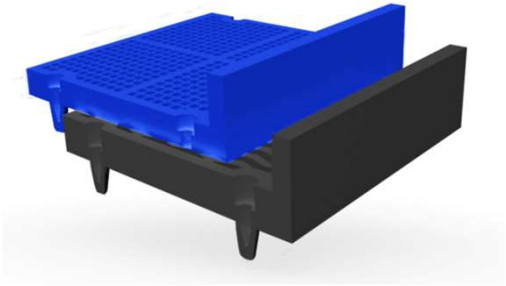
Deflectors



Skid Bars



Dams



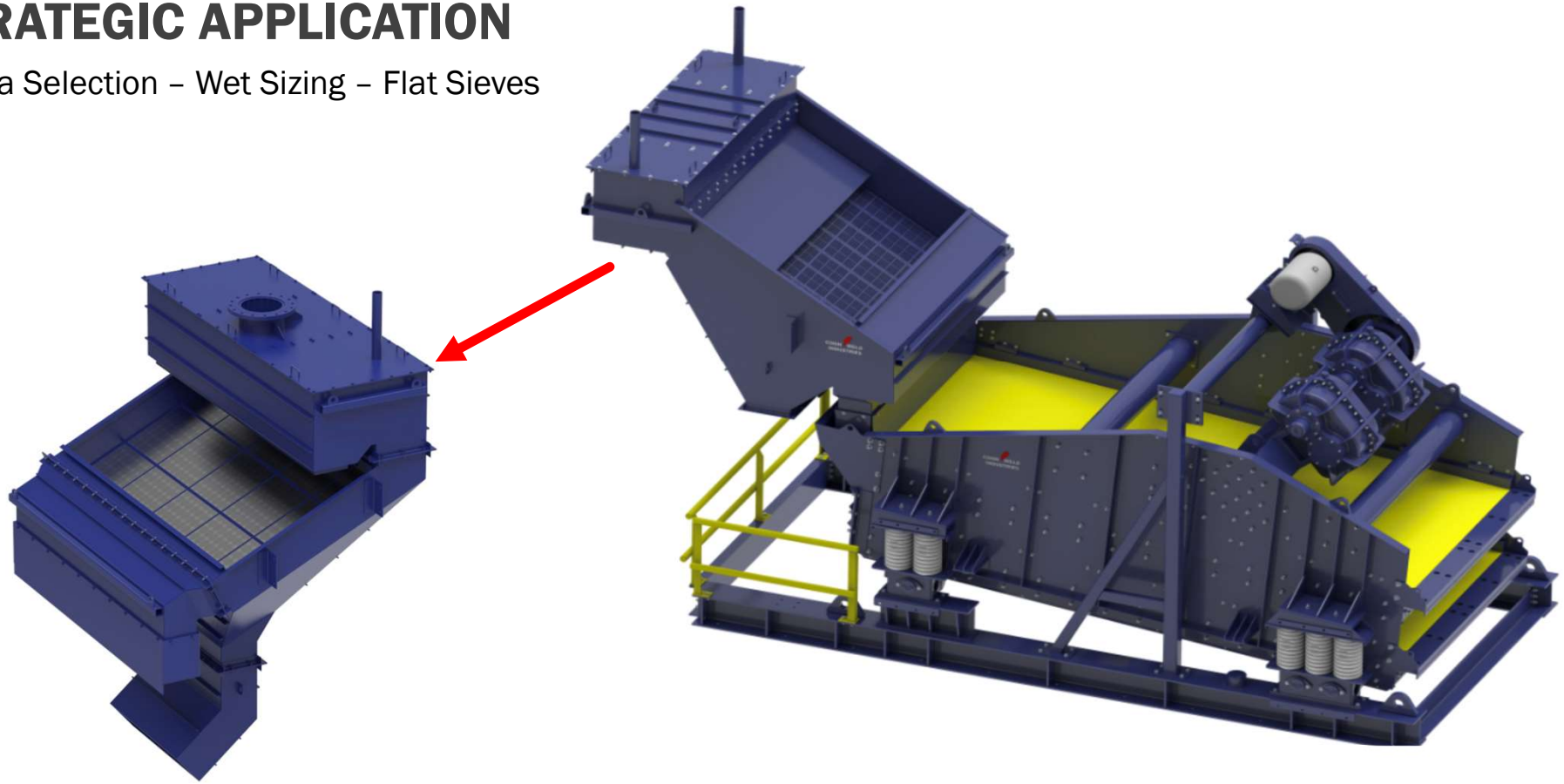
STRATEGIC APPLICATION

Proper Feed – Wet Sizing

Wash boxes “pre-soak” the material and help the efficiency of the screen. 1/3 of the water used on a wash screen should be applied here.

STRATEGIC APPLICATION

Media Selection – Wet Sizing – Flat Sieves

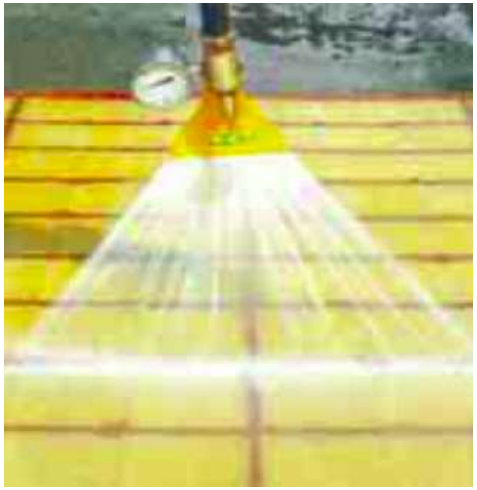


STRATEGIC APPLICATION

Media Selection – Wet Sizing & Rinsing

- How Much Water Pressure is Needed (PSI)
- Where to Measure the Water Pressure
- How the Pressure Affects the Material
- 40 PSI for cuts of 3/16” & above
- 40-60 PSI for cuts 1/8” & below
- Dam placement

20 PSI



40 PSI

STRATEGIC APPLICATION

Media Selection – Dewatering

QUESTIONS?

THANK YOU