Water and Effluent Treatment

StaticArc Screens

Screen Services
Specialty screens and equipment for industrial, petrochemical, mining, and water treatment applications

StaticArc Screens:

Screen Services' StaticArc sieve-bend screening unit is the answer to many de-watering, sizing, and wastewater cleanup problems. Typical uses are sewage treatment, laundry wash water clean-up, poultry, fish, fruit and vegetable wastewater processing, minerals processing, coal preparation, paper production, textile plants, and many more. A sieve-bend consists of a concave, curved profile wire screen mounted in a frame with the screen openings perpendicular to the flow. A curved screen has greater capacity than a flat screen due to forces exerted as material flows against the curved surface.

Sieve bends are also known as DSM screens, after Dutch State Mines, who introduced the sieve bend as a static sizing screen having ten times greater capacity than conventional vibrating screens.

As slurry flows down the screen each profile wire's sharp leading edge slices away a thin layer of water and solids. Adequate slurry dilution to maintain particle suspension is essential to efficient particle size classification. Separation size is considerably smaller than screen openings, usually about one half the opening size.

Features:

Low Headroom - only 1.1 metres (44″) tall for the 900 mm arc length unit.

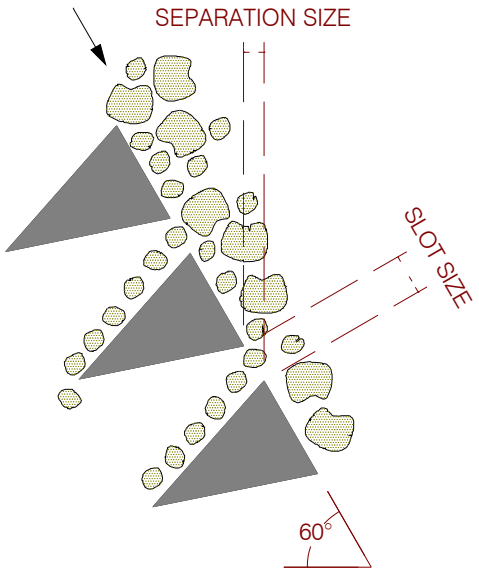
Energy Efficient - operates with no moving parts and with no energy input.**Space Efficient** - treats up to 122 litres per second per square metre of floor space.

Quiet Operation - no moving parts means no mechanical or electrical vibrations.

Accurate Sizing - can be used for sizing solid particles down to 0.2 mm (0.008″).

Low Maintenance - the profile wire screen resists clogging by near-size particles, and the all-stainless steel construction ensures a long, corrosion-free installation.

Easy Screen Replacement - a typical screen can be replaced in 10 minutes with no tools.



Sieve-bend effective opening is equal to half of the actual opening at 60° slope. Screen slope affects the separation size.

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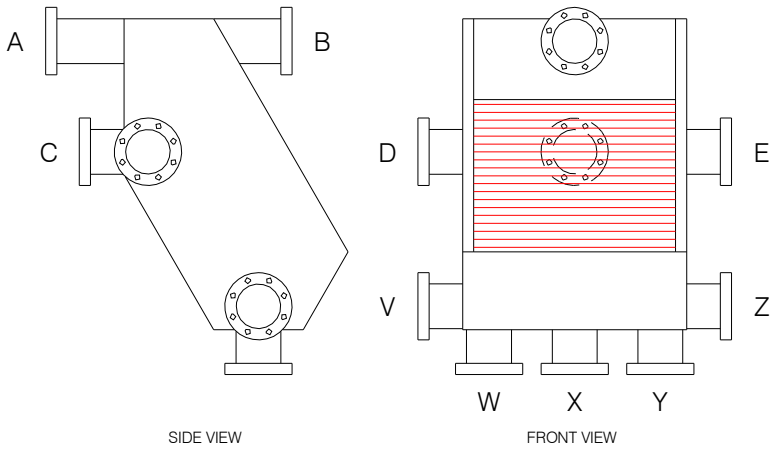
Phone (780) 460-8043 • Fax (800) 416-9354

Flexible Design - we can supply units with any features you may require, such as:

- ∇ Rear inlet and/or outlet flange.
- ∇ Side inlet and/or outlet flange.



ABCDE = Inlet Options
VWXYZ = Liquid & Fines Discharge options

Options:

Inlet: Five orientations are possible: **A B C D E** ANSI 150# bolting pattern plate or full thickness flange, Victaulic Stub or Threaded Pipe. Option C is suggested for solids with an S.G. of less than 1.0.

Outlet: Five orientations are possible: **V W X Y Z** ANSI 150# bolting pattern plate or full flange, Victaulic Stub or Threaded Pipe. Open base construction is available for direct discharge to hopper or tank.

Screen: Stainless Steel profile wire screen is used as standard. Polyurethane can be supplied for arduous conditions with highly abrasive solids.

Material: 3.1mm-thickness stainless steel type 304 is standard. Type 316 stainless steel or any other weldable metal can be supplied.

Doors: Fully enclosed construction can be supplied if desired to prevent product contamination.

Screen Hold-Downs: Quick release Camlok clamps and UHMW plastic bows are standard. Moulded polyurethane hold-downs are also available for arduous conditions with highly abrasive solids.

Lining: Polyurethane, Rubber, Ceramic Tile, or other wear resistant coatings can be applied to the wetted areas as required.

Spray Bars: For screen cleaning, primarily in batch processes where solids would otherwise tend to dry out and stick on the screen surface after the flow stops. Can also be used for dilution where applicable.

Special Designs: We will custom build to your design, or modify our design to fit your space constraints.

Drawings: Every **StaticArc** is built from an individually prepared CAD drawing. Work commences only after approval by the customer. Reproducible copies of drawings can be supplied if requested.

- ∇ Top entry baffle box.
- ∇ Solids discharge outlet pipe.
- ∇ Fully enclosed construction.Feed Variables Influence Performance:

Feed rate: Sieve-bends operate most efficiently at certain feed rates. Varying throughput below or above the optimum rate causes efficiency loss. Screens with larger openings have greater tolerance for feed rate variations.

Feed percent solids: Sieve-bend sizing efficiency is particularly susceptible to feed slurry dilution. The need to maintain particle suspension in the feed slurry is a critical concern. When the water is gone, sizing stops. Without adequate water, particle movement slows, flows intermittently or stops altogether. Sieve-bends operating at maximum efficiency should have some free water carry-over.

Specific gravity of the product, feed size and grain distribution are factors in determining proper density of sieve-bend feed. Feed dilution requirements generally vary between 10% and 20% solids by volume. Minus 28-mesh (0.6 mm) feed needs more dilute feed than 6 mm or larger feed. Feed contaminated with clay and other slimes requires increased dilution.

U.S. Bureau of Mines testing with minus 3 mm feed established 20% solids as optimum for best efficiency. Other testing with minus 28-mesh (0.6 mm) feed achieved best results with 12% solids.

Undersize material: Loss of efficiency is rapid when undersize drops below 20% of total solids feed.

Near-size material: Large amounts of near-size cause a loss of screening efficiency and make a coarser separation size.

Feed velocity: Dorr-Oliver established the need of maintaining a minimum Reynolds number, a dimension-less value that is a function of velocity, opening and viscosity, to insure non-blinding sieve operation (Re = (velocity x spacing) / viscosity). Screen openings smaller than 0.35 mm or viscosities above 3 centipoise (cp) require increased feed velocity.

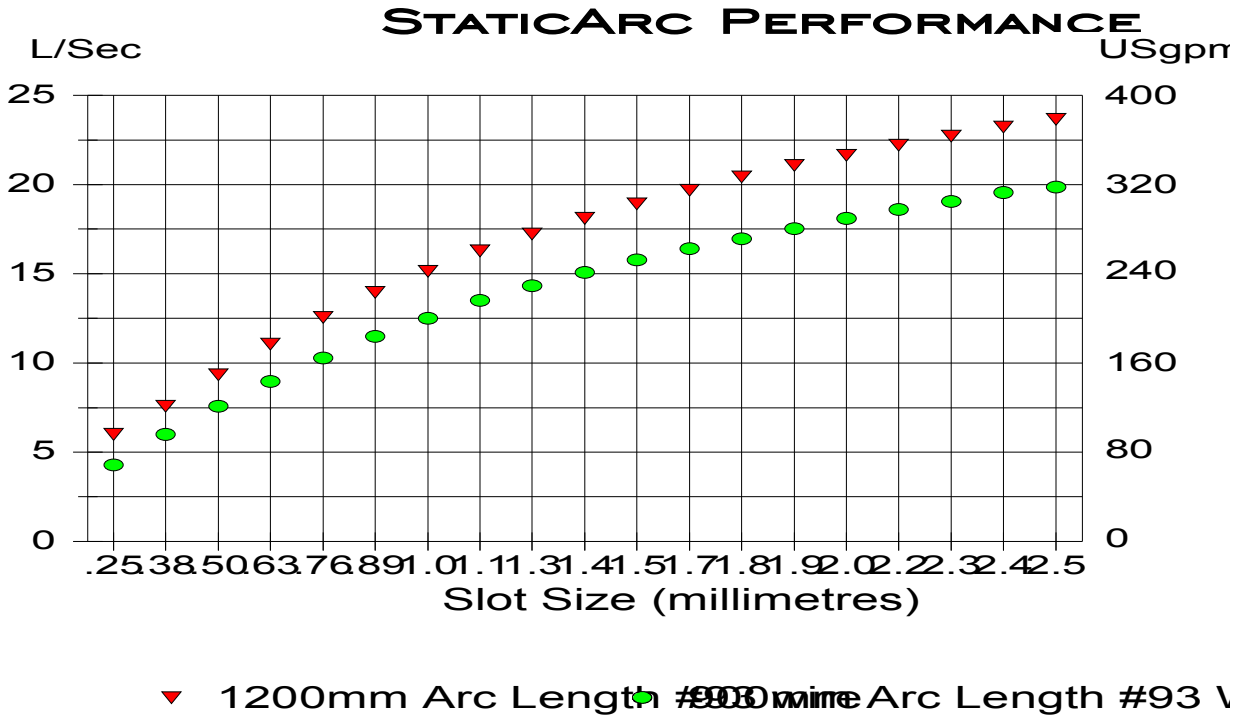
Dorr-Oliver expressed optimum feed velocity at 3 m/sec. or 500 mm falling height when operating with 0.35 mm screen openings and feed viscosity as high as 3 centipoise.

Capacity Improves With:

- reduced solids percentage
- increased screen width.
- tipped wire (affects separation point)
- rapping or vibrating if a high percentage of particles close to the separation size cause blinding. Handling of feeds containing slimes may also be improved.

Efficiency Improves With:

- increased screen length.
- increased percentage of coarse particles.
- optimised feed rate.
- optimised feed distribution.

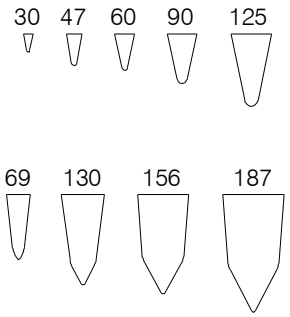


StaticArc performance data based on 20% weight solids in water at 20°C, per 300mm screen width. Other conditions may vary these figures - please make due allowance when ordering, or consult us with full details.

Specifications

Slot Opening Equivalents

INCHES	MM	MICRONS	STANDARD SIEVE	TYLER MESH	INCHES	MM	MICRONS	STANDARD SIEVE	TYLER MESH
.001	—	25	—	—	.033	.850	850	20	20
.0015	—	37	400	400	.039	1.00	1000	18	16
.002	—	50	270	270	.047	1.18	1180	16	14
.003	—	75	200	200	.049	1.25	1250	—	—
.004	.100	100	140	150	.056	1.41	1410	14	12
.005	.125	125	120	115	.059	1.50	1500	—	—
.006	.150	150	100	100	.066	1.68	1680	12	10
.007	.180	180	80	80	.069	1.75	1750	—	—
.008	.212	212	70	65	.079	2.00	2000	10	9
.010	.250	250	60	60	.089	2.25	2250	—	—
.012	.300	300	50	48	.094	2.38	2380	8	8
.014	.355	355	45	42	.098	2.50	2500	—	—
.017	.425	425	40	—	.108	2.75	2750	—	—
.020	.500	500	35	32	.111	2.80	2800	7	7
.023	.600	600	30	28	.118	3.00	3000	—	—
.028	.710	710	25	24	.132	3.35	3350	6	6
.030	.750	750	—	—	.157	4.00	4000	5	—



Wires shown approximately 2 times actual size.

Wedge Wire Sharp Series

Wedge Wire No.	Wire Width		Wire Height		Relief Angle
	In.	MM	In.	MM	
30	.030	.76	.080	2.03	10°
47	.047	1.19	.098	2.49	10°
60	.060	1.52	.100	2.54	13°
90	.090	2.29	.150	3.81	13°
125	.125	3.18	.200	5.08	13°

Wedge Wire Wear Series

Wedge Wire No.	Wire Width		Wire Height		Relief Angle
	In.	MM	In.	MM	
69	.069	1.75	.185	4.70	6°
130	.130	3.30	.250	6.35	8°
156	.156	3.96	.275	6.99	5
187	.187	4.75	.325	8.26	5°

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Profile Wire Screens, The Heart of Sieve Bends:

A profile wire screen is the most important sieve bend element. Its screen wires must be the correct size and shape, and the wires must have sharp corners. Accurately spaced wires are important, particularly in screens made with very small wires.

Screen Services supply only premium quality profile wire sieve bend screens with our Static-Arc screeners. Slot sizes are uniform to the most critical tolerances. Screen wires, manufactured to exacting design criteria of height, width, relief, temper and alloy, are available from 0.5 mm head width to 3.3 mm head width.

We can also provide the same quality screens for sieve bend screeners from other manufacturers. Call us with screen slot size, width, radius, and angle requirements for competitive pricing.

Sizing Screens That Aid De-watering:

Sieve bends are not a panacea for all screening problems. Their performance cycles from high to low efficiency and capacity, caused by profile screen wear. Such operating characteristics limit their ability to perform a complete de-watering job. Installed in combination with de-watering vibrating screens, sieves usually perform well. Two-stage sieves can also make a good team. If final product moisture is a primary objective, it may be necessary to constantly vibrate the second-stage unit to insure uniform travel and to prevent intermittent flow and solids build-up.

When to Rotate Sieve Bend Screens:

Timely screen inspections to determine the need for turning are necessary. Rotate screens when the trailing edge is sharp. Don't wait for a severe capacity loss to indicate need. Wear-induced efficiency loss is gradual and difficult to detect until capacity reduction becomes apparent. If a profile wire screen is operated in one position for too long, the wire's leading edge may become excessively dull and will not properly re-sharpen before the screen needs to be rotated again. In time the screen will not operate efficiently in either direction. Conversely, a profile wire screen can be rotated too frequently. If operation is not sustained long enough in one direction to re-sharpen the dull trailing edges, both edges become dull, and will not perform in either direction.

Sizes Available:

StaticArcs are available in widths up to 1830 mm (72") in 305 mm (12") increments.

Model	Nominal Width mm / in	Overall Height mm / in	Front Entry Depth mm / in	Rear Entry Depth mm / in	Net Weight kg / lb
24 x 45 x 45	660 / 26	1040 / 41	650 / 26	800 / 32	100 / 220
36 x 45 x 45	960 / 38	1040 / 41	650 / 26	800 / 32	125 / 280
48 x 45 x 45	1280 / 50	1100 / 43	700 / 28	850 / 34	150 / 330
60 x 45 x 45	1600 / 63	1100 / 43	700 / 28	850 / 34	180 / 400
72 x 45 x 45	1900 / 75	1100 / 43	750 / 30	900 / 36	220 / 490
24 x 60 x 45	660 / 26	1650 / 63	920 / 36	1070 / 42	150 / 330
36 x 60 x 45	960 / 38	1650 / 63	920 / 36	1070 / 42	200 / 440
48 x 60 x 45	1280 / 50	1720 / 68	1000 / 39	1150 / 46	225 / 500
60 x 60 x 45	1600 / 63	1720 / 68	1000 / 39	1150 / 46	270 / 600
72 x 60 x 45	1900 / 75	1720 / 68	1000 / 39	1150 / 46	320 / 700

All dimensions in millimetres / inches, all weights in kilograms / pounds