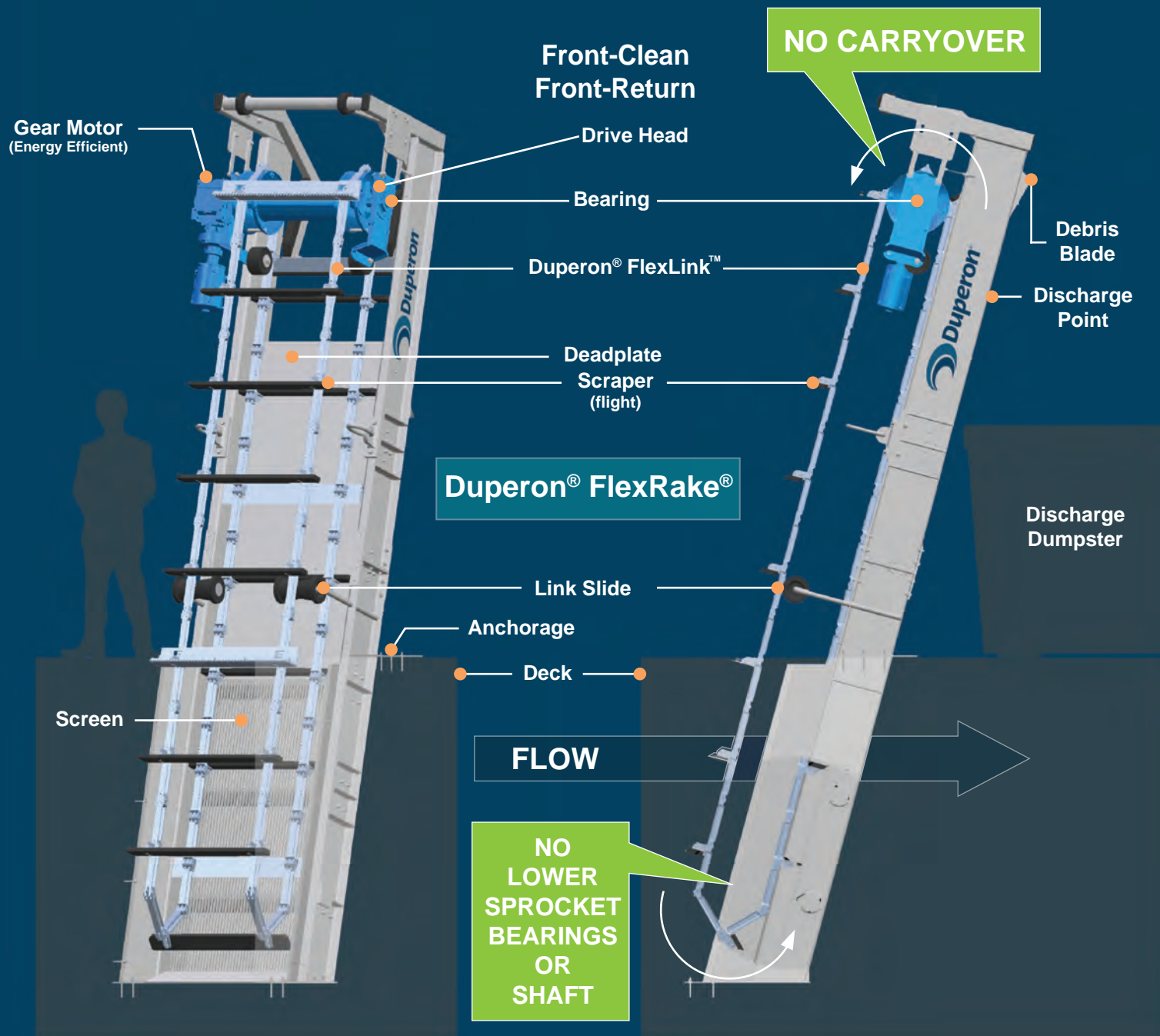


Wastewater Applications



Shown without  
enclosure

**The Duperon® FlexRake®**



Shown without enclosure

## The Duperon® FlexRake®



Only three basic components:

1. A powerful drive head
2. A durable raking device
3. A rugged bar screen







Duperon® simplicity of design solves many headaches associated with preliminary liquids/solids separation

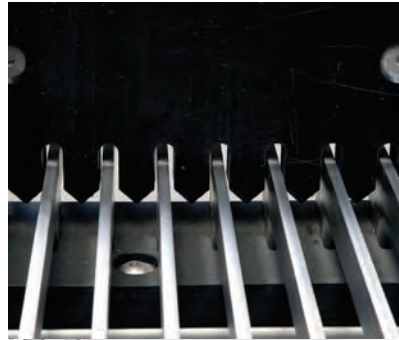
## ENGINEERED FOR DURABLE, RELIABLE OPERATION

The achievement of mechanical simplicity requires the design of one part doing more. The simplicity of the Duperon® FlexRake® is possible through the multi-functioning action of one part: the FlexLink™. This innovative design allows the link to function as a frame, lower sprocket, and connection point for scrapers, and be driven by a single sprocket. The rugged bar screen has a frame which guides the chain and relocates it in the screen. Bottom line: simplicity works when it achieves a simple cleaning mechanism with trouble-free longevity.

The design of the Duperon® FlexRake® solves many of the headaches associated with liquids/solids separation equipment: complex gear mechanisms and controls; high maintenance components subject to regular lubrication, wear or fouling; confined space entries; reversal of mass in systems that must travel in one direction and then auto-reverse; carryover; shutdown due to unexpected debris volumes or conditions; inability to remove accumulation at the bottom of the channel...

### How the Duperon® FlexRake® works...

<p><b>1.</b></p> 	<p>The FlexLink™ articulates to a 90 degree angle, closing on the drive pin. Once closed, the sprocket drives the link system forward.</p>	<p><b>2.</b></p> 	<p>As it leaves the drive sprocket, the FlexLink™ locks into a solid bar, forming its own frame. (It works similarly to a knee or elbow.)</p>	<p><b>3.</b></p> 	<p>As the FlexLink™ chain and attached scrapers reach the bottom of the screen, the FlexLink™ forms its own rotating framework.</p>
<p><b>4.</b></p> 	<p>Once the links turn to travel slowly up the screen, they are engineered to allow clearance around the pin and water lubrication, allowing stainless on stainless movement without gouging or wear.</p>	<p><b>5.</b></p> 	<p>Industry-exclusive Thru-Bar™ technology features scrapers designed to clean 3 sides of the bar, as well as horizontal cross members.</p>	<p><b>6.</b></p> 	<p>Multiple scrapers placed every 21 inches continuously rake the bar screen. With screen head-loss minimized, some sites report a 3x greater capture rate than with their previous machines.</p>



## DEBRIS ACCUMULATION ELIMINATED

The Duperon® FlexRake® wastewater product line offers industry-exclusive Thru-Bar™ Technology with a scraper designed to clean 3 sides of the bar – as well as cross support members – so debris simply cannot accumulate. Assembly/disassembly is simple... just 4 bolts, from the deck. This Duperon® technology leaves nothing to chance.



## ELIMINATES FOULING POINTS

The Duperon® FlexLink™ system is an innovative solution to complex gear sprocket mechanisms - simple 90 degree articulation drives the unit. No tight clearances to bind or jam; no close tolerances to foul due to corrosion or wear.



## UNHAMPERED BY LARGE DEBRIS

As the Duperon® FlexRake® flexes and pivots around large debris, rigid side fabrications are angled to guide the scrapers to return engagement. This simple method for positive location, along with the scraper's lateral containment by that same rigid frame, ensures the continuous engagement of each successive scraper.

- ENERGY EFFICIENT
- LONG PRODUCT LIFE



## REDUCES HEADLOSS, IMPROVES CAPTURE

Multiple scrapers on the screen operating at a speed of 0.5 rpm discharge debris once per minute. The slow operating speed provides long product life. Multiple scrapers minimize debris accumulation, resulting in reduced headloss and slot velocity, as well as greater capture rates.



## KEEPS YOU IN CONTROL

Start it up... let it run. In their simplest form, controls are designed for continuous operation. Duperon offers pre-engineered packages that range from basic (continuous operation) to complex (level control with complete SCADA integration).

## ELIMINATES ALL SPROCKET-RELATED PROBLEMS

The exclusive flex/pivot action of the Duperon® FlexRake® allows all types of debris to be removed, all at the same screen – regardless of coarse or fine screen openings. With the rugged durability of Duperon equipment, prescreening is no longer a necessity. The design of the Duperon® FlexRake® eliminates the need for a lower sprocket and the common problems that come with it. No lower sprocket means no drive shaft, drive sprockets, or bearings requiring in-channel lubrications. No tracks, gaskets, seals or other close tolerances prone to wear due to grit. Most importantly: NO confined space entries.



## STRONGEST IN THE INDUSTRY

### THE DUPERON® SOLUTION TO

- LOWER SPROCKETS
- BEARINGS
- SHAFTS
- LUBRICATION POINTS
- CONFINED SPACE ENTRIES
- TRACKS...

### THE DUPERON® LINK SYSTEM:

The Duperon® FlexLink™ design utilizes a stainless steel cast link system to create its own in-channel rigid framework and scraper connection point. With a 33,000 lb yield and 60,000 lb break point, it forms a chain that is stronger and more hard-wearing than any other in the industry. That's strength where it's needed most!



## VIRTUALLY INDESTRUCTIBLE

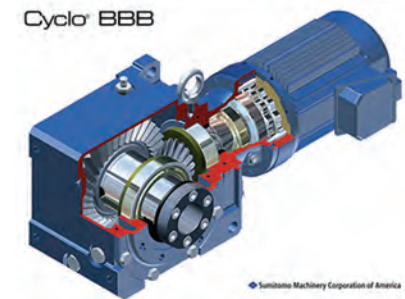
State-of-the-art materials such as UHMW and stainless steel are used for all wetted parts, eliminating corrosion in the harsh wastewater environment. Such materials ensure the highest duty of performance, designed such that the pressures and velocities exerted by the equipment and environment will assure a long life cycle.



Cyclo® BBB

## MAINTENANCE AT FIVE-YEAR INTERVALS

This powerful drive lifts up to 1,000 lbs. The Duperon use of premium efficiency Sumitomo Cyclo gear motors eliminates abrasive sliding contact. Unique rolling contact, low operating speeds and the grease-filled non-vented gearbox allow for five-year maintenance schedules.



Sumitomo Machinery Corporation of America

## FIVE-YEAR WARRANTY

With more than 25 years in the industry and over 1000 machines worldwide... Duperon has the experience to assure excellence with the industry's first Five-Year Warranty. Duperon® technology leaves nothing to chance... we guarantee it.



### EASIER TO INSTALL

The Duperon® FlexRake® ships fully assembled to sites without space or handling constraints, creating installation as simple as pick, place, anchor, wire and run.

When site constraints such as limited access doors, multiple floors, and handling constraints exist, the Duperon® FlexRake® ships fully factory-tested to be disassembled on site. The Duperon simplicity of design makes re-assembly easy, with sites often accomplishing re-assembly and installation in one day – sometimes using an on-site maintenance crew.

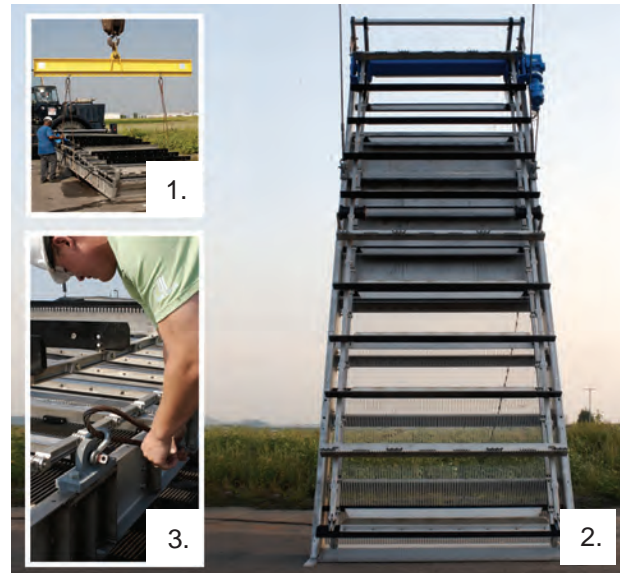
### LESS MAINTENANCE

Maintenance Schedule	
Daily	None
Monthly	None
Semi-Annually	Check drive and bearing for any apparent leakage or damage. Lubricate bearing.
Annually	Check drive and bearing for any apparent leakage or damage. Verify unit condition.
5 year	Change grease in gearbox.

NOTE: Maintenance is reduced by the simple design of the Duperon® FlexLink™, which is engineered for water lubrication. Slow operating speeds of 0.5 rpm allow for lubrication of the gear motor to occur every 5 years or 20,000 hours.

### SIGNIFICANTLY LOWER COST OF OWNERSHIP

Maintenance Schedule and Estimated Labor Hours				
		1 year	5 year	20 years
Daily	None	0.0	0.0	0.0
Monthly	None	0.0	0.0	0.0
Semi-Annually	Visual inspection/lubrication of bearing and seals.	0.5	2.5	10.0
Annually	Visual inspection for general mechanical condition.	0.5	2.5	10.0
	Check grease in gearbox.	0.5	2.5	10.0
	Visual inspection of snap rings.	2.0	10.0	40.0
Total Labor Hours		3.5	17.5	70.0



1. Lifting units with use of spreader bar
2. Placing unit at installation angle
3. Use of lifting brackets (for units >4500 lbs.)

### LOW PROFILE MEANS REDUCED CONSTRUCTION COSTS



The tougher functionality of the Duperon® FlexRake®, proven through repeated grease attacks and high I & I, was just one benefit of the equipment's installation in Phoenix, Arizona. During plant upgrades, the low profile of the Duperon® FlexRake® saved over \$1M in construction costs when compared to previous equipment.

### UNINTERRUPTED BY GREASE AND GRIT ATTACK

In 2004, the City of Monroe, Michigan participated in a “cleaning project” initiated for the purpose of raising awareness of the grease problem within commercial business concerns such as car washes (wax) and restaurants (grease). Prior to the project, influent sewer lines were chemically treated to break down the accumulation of grease, wax and similar solids in successive stages. As was typical, one Duperon® FlexRake® in the City's 6 foot channel was in operation for the project.

Unexpectedly, grease, wax and other solids hit the plant nearly at once, creating a “grease attack” at the headworks. This “attack” overwhelmed the conveyor, but the Duperon® FlexRake® continued as normal, removing several inches of grease and debris with each pass at the screen. The Duperon® FlexRake® maintained headworks operations; when the crew returned the following morning, they found plant processes continuing uninterrupted.

“Ingenious...screenings are 50% drier than what I was seeing before...”  
-Michigan installation



1. City of Monroe grease attack
2. Stones/grit easily lifted
3. Duperon® FlexRake® flexing around a barrel

### PROVEN STANDARD OF EXCELLENCE

In 2006, Duperon® was the first to offer a Five-Year Warranty in wastewater—the industry's toughest standard for equipment excellence.

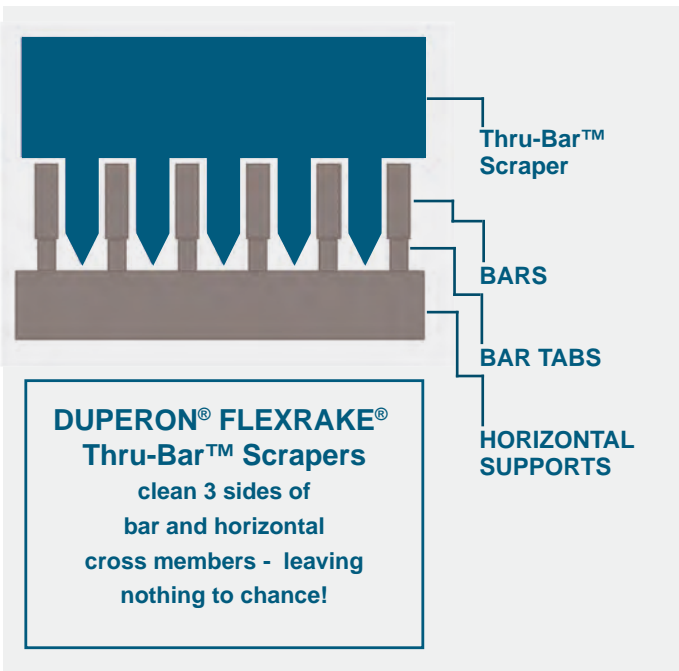


New Mexico

2/3 reduction in disposal volume!  
-Pennsylvania installation

### DUPERON® SYSTEM OPTIMIZES SAVINGS

An installation in Pennsylvania has reported satisfaction exceeding expectations. Historically, the Authority had disposed of one 3 cubic yard dumpster each week. The dumpster contained extremely wet organic screening waste. The combined installation of a Duperon® FlexRake® and a Duperon® Washer Compactor has reduced this disposal to one 2 cubic yard dumpster every two weeks. With no standing water, there has been significant reduction of weight, thereby reducing trucking and disposal costs. Odor has been considerably reduced, and the dryness of the compacted screenings has improved appearance on disposal. The combined efforts of the Duperon® FlexRake® and the Duperon® Washer Compactor have also had a very favorable impact on maintenance processes downstream.



## DUPERON® FLEXRAKE® FP FOR GREATER THAN 1/2 INCH OPENINGS

The Duperon® FlexRake® FP is typically used in wastewater or other applications where debris can accumulate or wrap around the bars. The scraper is designed to clean 3 sides of the bar. The Duperon® FlexRake® FP model is available in bar spacings greater than .5 – 4 inches. If the site allows, this model ships fully assembled. All components are serviceable above the deck, eliminating confined space entries. The FlexLink™ system flexes and pivots around large debris and removes it. Virtually maintenance free!

## CONTINUOUS OPERATION ASSURED

The Duperon® FlexRake® handles grease and grit without difficulty, as well as large or unusual debris conditions ranging from sewer plugs to 2" x 4"s. Varied flow and influx of debris are no longer an issue. The Duperon® FlexRake® is designed to continue running through all conditions – assuring that the plant will continue to function without shutdown or operator intervention.



Grease attack? No problem!



Factory demonstration of 4"x4" entering screen at bottom of channel.

<b>WIDTH-LENGTH</b>	18 inches to 12 feet wide. 10 feet to 100 feet long. (Optional: Units wider than 10 feet are considered dependent on site specifications and should be discussed with Duperon Corporation.)
<b>SINGLE-STRAND WIDTH</b>	Also available for channels 18 inches - 24 inches.
<b>ANGLE OF INSTALLATION</b>	Range from vertical to 45 degrees dependent on site conditions.
<b>MATERIAL OF CONSTRUCTION</b>	Standard: 304 SSSL. Alternative: 316 SSSL.
<b>BAR OPENING</b>	.63 inches to 4 inches.
<b>SCRAPER CONFIGURATION</b>	Spacing: Every 2nd link or 21 inches. UHMW Thru-Bar™ scrapers.
<b>TYPICAL MOTOR/SPEED</b>	1/2 HP, explosion proof, inverter duty - operating speed of .5 - 2 rpm.

## DUPERON® FLEXRAKE® FPFS, FINE SCREEN MODEL 1/4, 3/8, 1/2 INCH BAR OPENINGS

The smaller the slot opening, the more critical it becomes to keep the bar screen open. The Duperon® FlexRake® FPFS combines the rugged reliability of the Duperon® FlexRake® FP with fine screen openings. Utilizing staging scrapers that clean the face of the bar screen and stainless steel teeth that fully penetrate the bar, the Duperon® FlexRake® FPFS offers precision technology with the ability to adapt to large debris. Duperon has eliminated the need for pre-screening... the powerful combination of stainless steel and UHMW scrapers allows for the best in redundancy and unit performance.

## THE BEST SCREENING EFFICIENCY IN THE MARKET

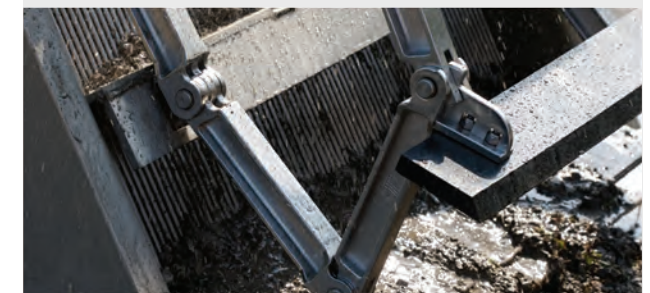
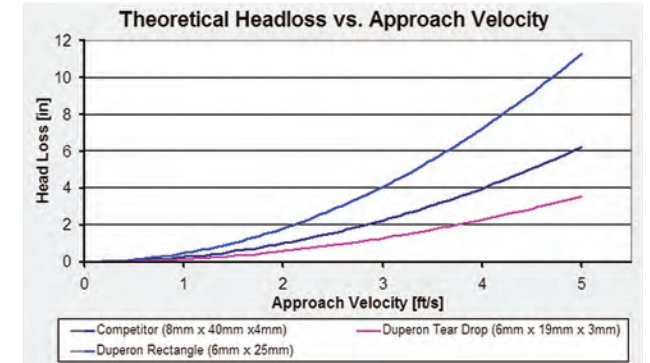
The Duperon® FlexRake® FPFS utilizes custom tear-shaped bars with a 50% screening efficiency for .25 inch bar openings, resulting in more favorable flow characteristics and less headloss. The unique teardrop shape keeps large debris on the surface of the screen for removal by scrapers. Small debris flows right through, and Thru-Bar™ scrapers assure that no debris can accumulate, even on horizontal cross members.

Bar Type	
Sharp-edged rectangular	2.42
Rectangular with semicircular face	1.83
Circular	1.79
Rectangular with semicircular upstream and downstream face	1.67
Tear Drop shape	<b>0.76</b>

Lin, Shundar. Water and Wastewater Calculations Manual. New York, New York. McGraw-Hill, 2001.

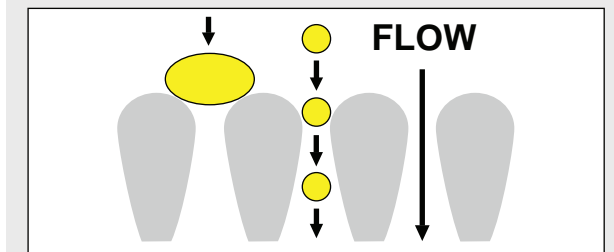
**MOST EFFICIENT**

<b>WIDTH-LENGTH</b>	2 feet to 12 feet wide. 10 feet to 100 feet long.
<b>SINGLE-STRAND WIDTH</b>	Also available for channels 18 inches - 24 inches.
<b>ANGLE OF INSTALLATION</b>	Range from vertical to 45 degrees dependent on site conditions.
<b>MATERIAL OF CONSTRUCTION</b>	304 SSSL. Alternative: 316 SSSL.
<b>BAR OPENING</b>	.25 inch, .38 inch, .5 inch.
<b>SCRAPER CONFIGURATION</b>	Spacing: Every 2nd link or 21 inches. UHMW staging scrapers/stainless steel Thru-Bar™ teeth positioned at maximum ratio of 3:1.
<b>TYPICAL MOTOR/ SPEED</b>	1/2 HP, explosion proof, inverter duty-operating speed .5-2 rpm.

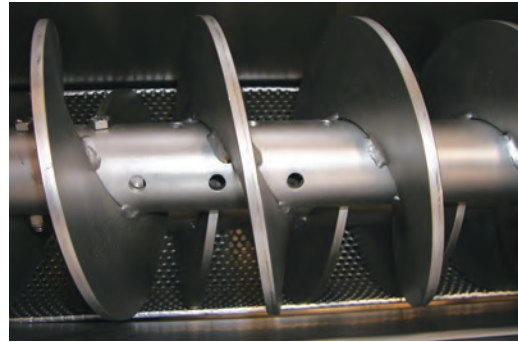


## EXCLUSIVE ABILITY TO CLEAN THE BOTTOM OF THE CHANNEL

Due to the "square" sprocket action of the FlexLink™, the Duperon® FlexRake® has the unique ability to hit the base plate of the frame with a scraping, shoveling action that moves debris up the screen, eliminating accumulation at the channel bottom plate.



**TEAR DROP BARS ARE THE MOST EFFICIENT BARS IN THE INDUSTRY**



### DUPERON® WASHER COMPACTOR

Continuing the tradition of simple, efficient, effective products... Exclusive patent-pending positive displacement technology adapts to variations in influent debris. Unique dual-auger design eliminates the need for additional agitation. Flood washing saturates screenings, eliminating clogging issues inherent in fine spray nozzles. Resulting compacted debris is light grey in color, with volume reduction of up to 82%.



### DUPERON® AUGER CONVEYOR

The Duperon® Auger Conveyor is flexible (can bend up to 30°) and scalable to site constraints, with modular components that make assembly – and additions – simple. Constructed of abrasion-resistant UHMW and built to uphold the Duperon® tradition of tough durability; powered by the energy-efficient Sumitomo Hyponic drive. A multitude of accessories are available, such as splicing kits, legs, standard mounting holes, and more.



### DUPERON® ENCLOSURES

For added convenience and cleanliness, Duperon® enclosures are built to site specifications. Each is available in rugged 304 or 316 stainless steel. Front access panels with options available for SSTL or polycarbonate materials. Rear has lift-off hinged doors with viewing windows. Units without enclosures are optional dependent on site, and should be discussed with Duperon Corporation.



### DUPERON® CONTROLS

Duperon offers economical standard control packages as well as PLC, enhanced VFD with differential level controls and completely custom packages, to suit your needs. Please contact us for available options.



Arizona



California



Michigan

The Duperon® FlexRake®



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