

# Grit Removal Systems

For Municipal Wastewater Treatment



# Wastewater Grit Removal

Abrasive, heavy and insoluble, inorganic grit poses a threat to many of the processes and equipment found in municipal wastewater treatment plants. If not removed, grit can accumulate in aeration basins, digesters, heat exchangers, pipelines and channels. It accelerates wear on mechanical equipment, reducing the service life of pumps, centrifuges, valves and bearings, and increasing the costs of operation and maintenance.

To control these costs, Eimco Water Technologies manufactures a complete range of collection and separation systems specifically engineered for cost-effective grit removal at the plant headworks. Our grit systems offer simple, reliable and continuous removal with the design flexibility to satisfy virtually any set of influent characteristics and disposal requirements.

## Type-B Grit Collector

The Type-B (bridge mounted) Collector is one of the simplest, most reliable and maintenance-free grit removal devices available. Its operation requires minimal hydraulic head and flow control, and its design eliminates waste water contamination of vital moving parts.

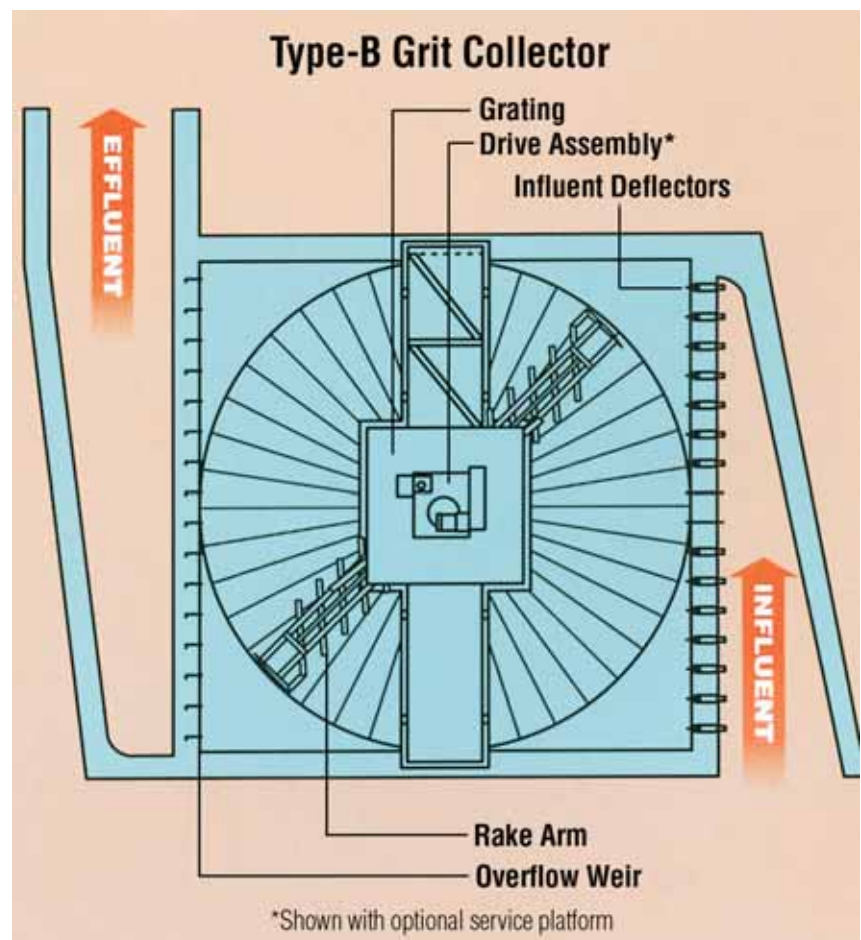
Designed for squared tanks with grouted corners, this unit consists of a rotating, center-driven rake mechanism mounted on a structural bridge which spans the collection basin. Two rake arms with outward raking blades are attached to the center shaft which is suspended from the bridge-mounted drive. Operator access to the

drive is provided via a walkway with surrounding handrail extending from one side of the basin. An optional platform provides additional work area.

Screened influent enters one side of the collector, passing through adjustable deflector plates which distribute flow evenly across the basin for maximum removal efficiency. Heavy grit settles to the tank floor and is raked to a collection hopper on the basin perimeter for transport to a classifier or separator. Degritted effluent passes out the opposite side of the tanks to the next stage of treatment.

Type-B Grit Collectors are available in sizes from 10 through 40 feet in

diameter. Designed on a hydraulic loading basis, the collector can be sized to efficiently remove up to +150 mesh grit with specific gravity of 2.65. See Table 1 for specific sizing guidelines.

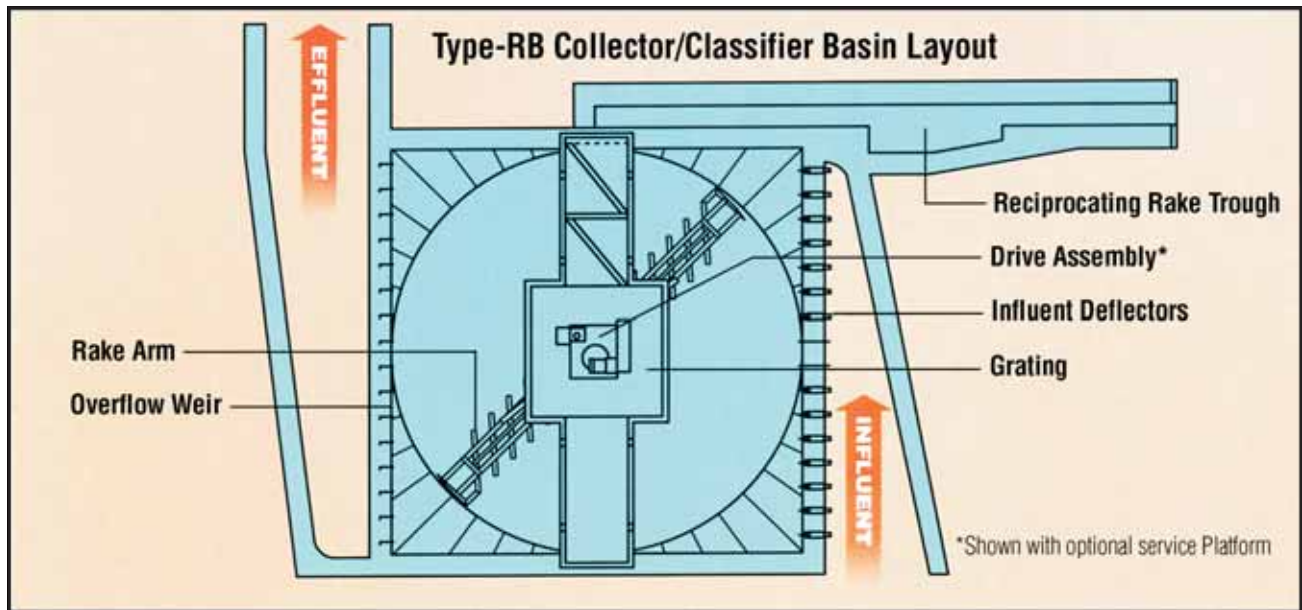


# Type-B Grit Collector Sizing

Flow Rate			65 Mesh*	100 Mesh*
(MGD)	(CFS)	(GPM)	(FT x FT)	(FT x FT)
1	1.55	694	8 x 8	8 x 8
2	3.09	1,389	8 x 8	10 x 10
3	4.64	2,083	10 x 10	12 x 12
4	6.19	2,778	10 x 10	14 x 14
5	7.74	3,475	12 x 12	16 x 16
6	9.28	4,166	14 x 14	18 x 18
7	10.83	4,861	14 x 14	18 x 18
8	12.38	5,555	14 x 14	20 x 20
9	13.92	6,250	16 x 16	20 x 20
10	15.47	6,940	16 x 16	22 x 22
11	17.02	7,638	18 x 18	22 x 22
12	18.56	8,333	18 x 18	24 x 24
13	20.11	9,027	18 x 18	24 x 24
14	21.66	9,722	20 x 20	26 x 26
15	23.21	10,416	20 x 20	26 x 26
16	24.75	11,110	20 x 20	28 x 28
17	26.30	11,805	22 x 22	28 x 28
18	27.85	12,500	22 x 22	28 x 28
19	29.39	13,194	22 x 22	30 x 30
20	30.94	13,888	24 x 24	30 x 30
21	32.49	14,582	24 x 24	30 x 30
22	34.03	15,277	24 x 24	35 x 35
23	35.58	15,971	24 x 24	35 x 35
24	37.13	16,666	26 x 26	35 x 35
25	38.68	17,360	26 x 26	35 x 35

\*Sizing based on specific gravity of 2.65 and 90 percent removal. Headloss is 0.36 percent of water depth. For sizing of collectors based on unlisted mesh sizes, please contact your local Eimco Water Technologies representative.

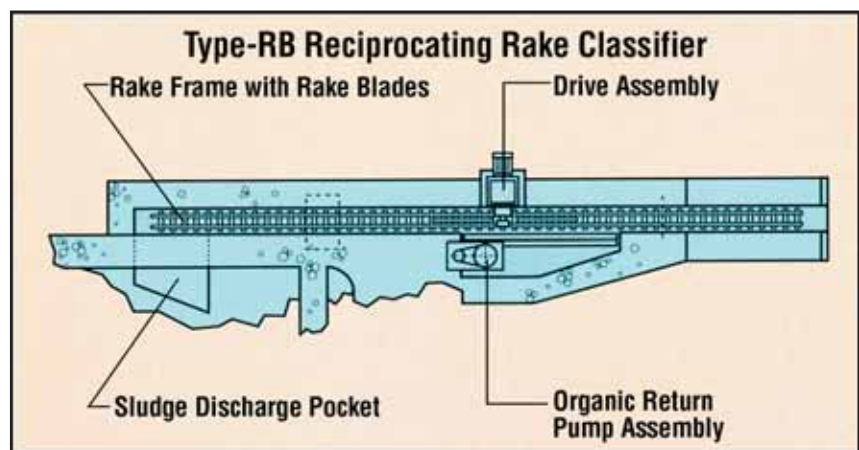
# Type-RB Collector and Classifier



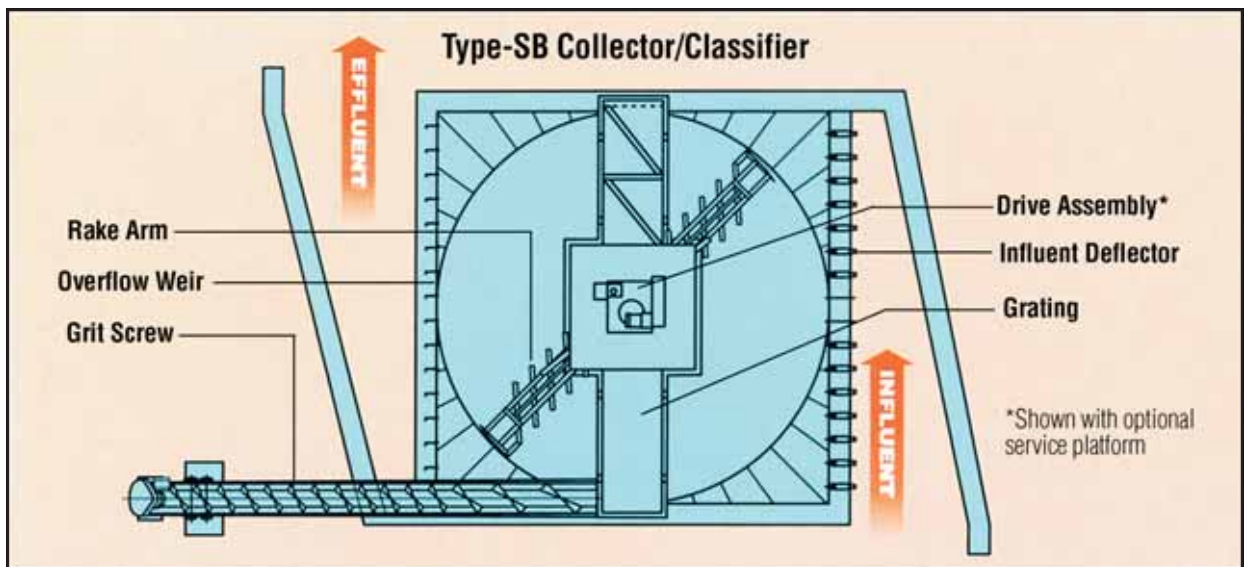
Type-RB Grit Collector/Classifiers utilize the same basin layout and bridge-supported rake mechanism as the Type-B Grit Collector, with the addition of a reciprocating rake classifier.

The classifier consists of a reciprocating rake mechanism set in an inclined concrete channel alongside the collection basin. Settled grit passes from the basin discharge sump to the classifier and is raked upward along the incline. In the process, putrescible organics are liberated and washed free, leaving clean grit for discharge and reducing odor problems often associated with the degritting process. A recycle pump returns organic material to the degrittied influent stream for further treatment.

As with the Type-B Collector, the classifier design allows all drive components and bearing to be located above liquid level, reducing the incidence of wastewater contamination.



# Type-SB Collector and Classifier



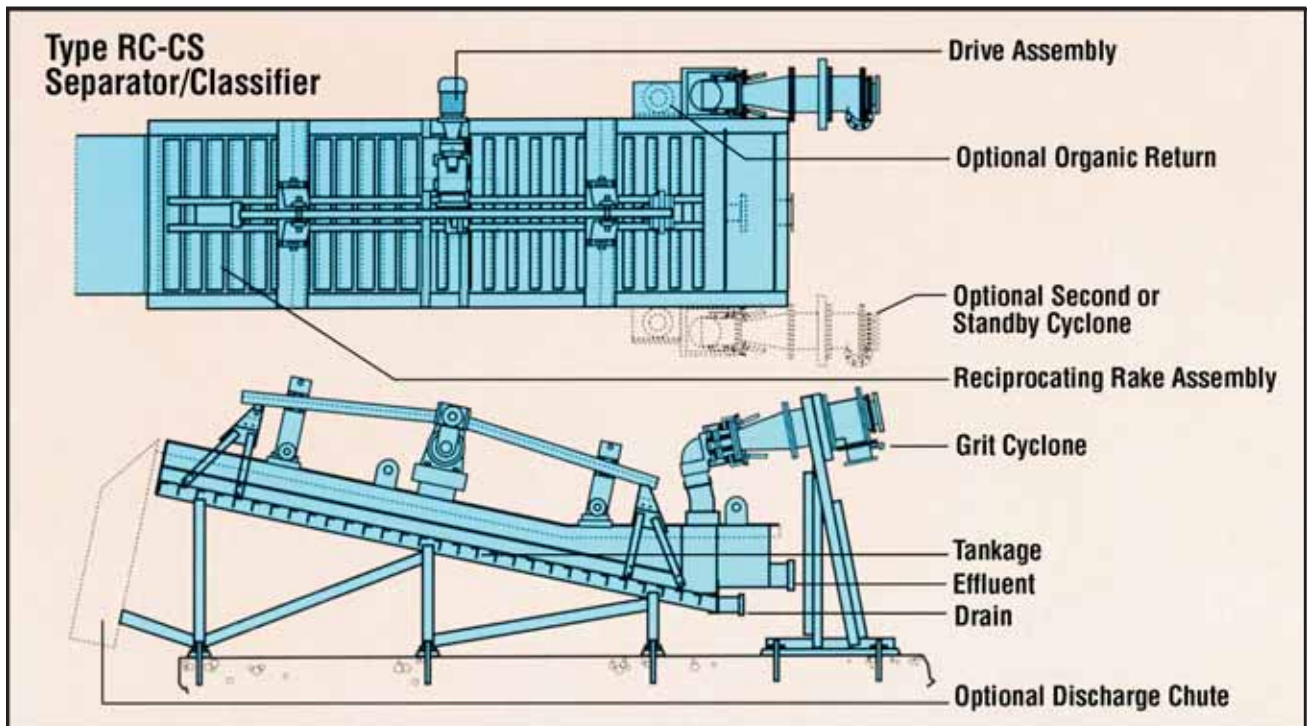
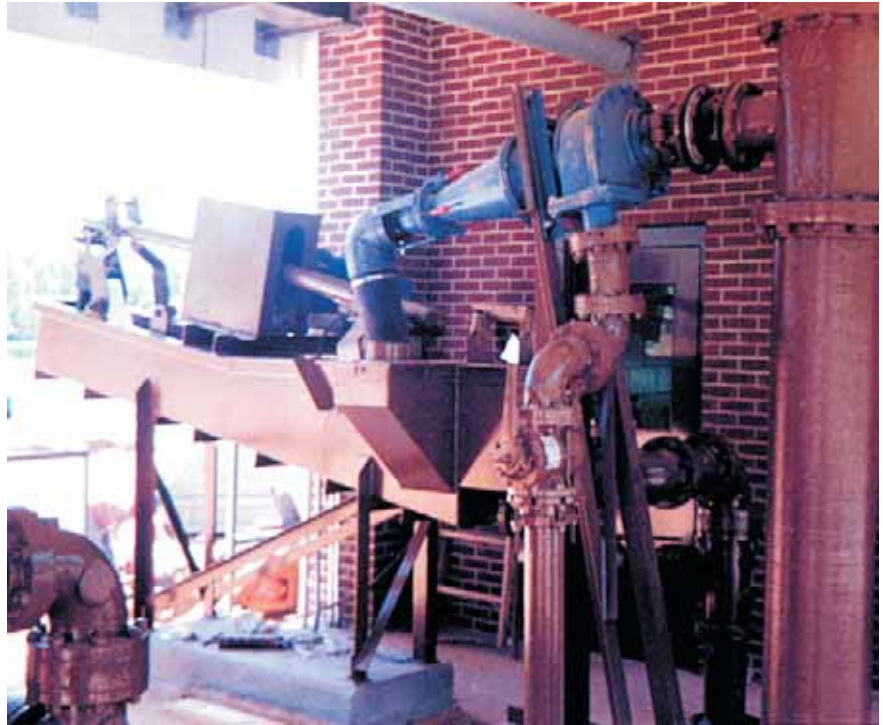
Type-SB Systems feature a Type-B Collector equipped with a grit screw classifier. The grit screw consists of a tubular steel shaft and helical flight assembly set in a semicircular steel trough within a concrete channel. A gear motor located at the top of the assembly rotates the screw, elevating and washing separated grit for discharge. Flight pitch varies between the pickup and washing zones to ensure thorough cleaning.



# Type RC-CS Grit Separator and Classifier

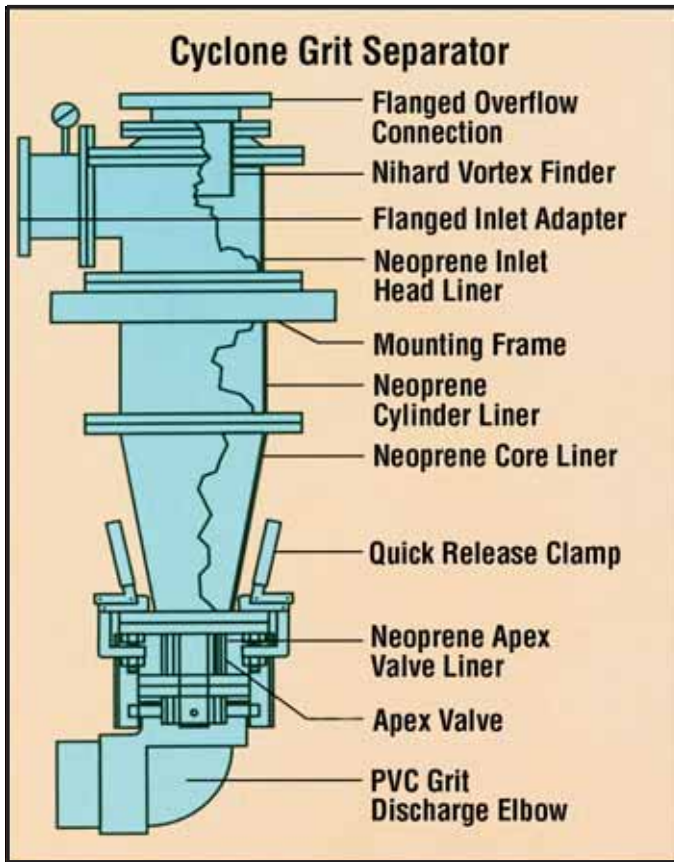
The Model RC-CS is a self-contained separator/classifier that combines a cyclone separator with a reciprocating rake classifier in a free-standing, inclined steel tank. It can be used in conjunction with a Type-B Collector or any other grit collection system.

Grit is pumped from the collection basin to the cyclone separator where solids are concentrated, then transferred to the classifier for washing and discharge by the rake mechanism. The 85% volume reduction provided by the cyclone allows this unit to be placed in very compact tankage, and reduces the costs for disposal of separated grit.

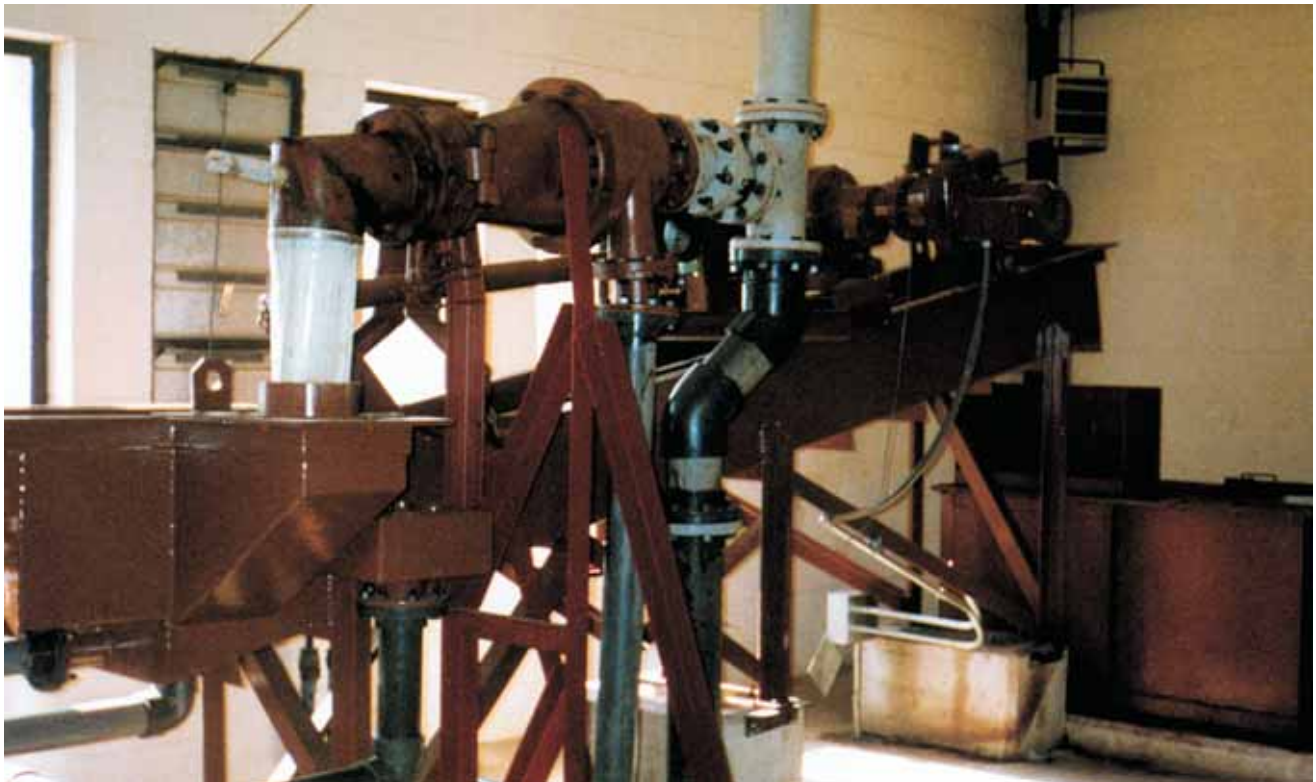


Cyclone Feed Range (GPM)	Cyclone Underflow Range (GPM)	Pool Area (SQ.FT)	Raking Capacity (Tons/Day)	HP	Length	Width
0 to 260	0 to 39	7.0 to 8.8	7.5 to 38.0	1	9' - 7"	1' - 2"
260 to 340	40 to 51	9.0 to 11.4	10.0 to 51.0	1	15' - 0"	1' - 6"
340 to 460	52 to 69	12.0 to 15.2	14.0 to 70.0	1	15' - 0"	2' - 0"
460 to 680	70 to 102	18.0 to 22.8	21.0 to 108.0	1 1/2	15' - 0"	3' - 0"
680 to 900	103 to 135	24.0 to 30.4	29.0 to 146.0	1 1/2	15' - 0"	4' - 0"

# Type RC-CS Grit Separator and Classifier



Cyclone Model	Cyclone Feed Range (GPM)	Cyclone Underflow Range (GPM)
D6B-12	0 to 64	0 to 10
D10B	64 to 130	10 to 20
D10LB	130 to 230	20 to 35
D15B	230 to 340	35 to 51



# Aerated Grit Chambers

Aerated grit collection systems use diffused aeration and strategically positioned baffles to setup and maintain a controlled rotational velocity within the separation basin, creating what is in effect a low-velocity cyclone. Grit is deposited in a horizontal floor trough and removed from the basin by a screw conveyor, while lighter organics flow out of the tank via the effluent trough. Aeration is supplied by headers equipped with Type-P coarse bubble diffusers. A single longitudinal circulation baffle directs rotational flow while a vertical baffle located at the far side of the grit chamber prevents short circuiting.

Eimco Water Technologies aerated grit chambers operate at relatively constant efficiency over a wide flow range and require minimal hydraulic head. The controlled circulation velocity provides flexible grit removal and partial aeration while lowering energy costs.

