



**Smith & Loveless Inc.**

# **PISTA<sup>®</sup>**

**GRIT REMOVAL SYSTEM**

**Advanced Grit Removal Technology**





Smith & Loveless Inc.

Superior Performance | Lowest Total Cost of Ownership | Unequaled Experience



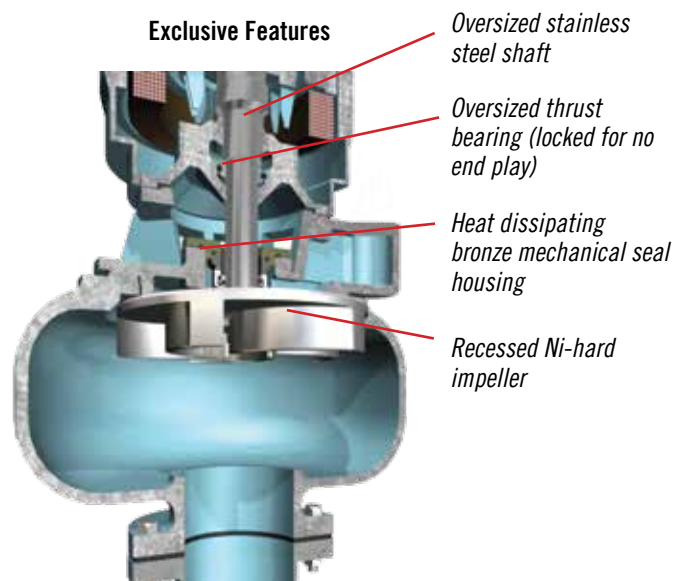
Since pioneering the first flat-floor vortex grit removal system, S&L Engineering leads the water industry in advanced grit removal research and development. We emphasize the combination of CFD analysis with the practical approach of internal and field testing. These thorough engineering approaches lead to a vast array of state-of-the-art grit removal system technologies. The PISTA® brand has become the most-specified grit removal system in North America.

### S&L Grit Removal System Efficiencies

Model	50 Mesh 300 Microns	70 Mesh 210 Microns	100 Mesh 150 Microns	140 Mesh 105 Microns
PISTA® VIO™	95%	95%	95%	95%
PISTA® 360™ B	95%	95%	95%	95%
OPTIFLOW 270™	95%	95%	95%	N/A
PISTA® 360™ A	95%	85%	65%	N/A
PISTA® 270™	95%	85%	65%	N/A

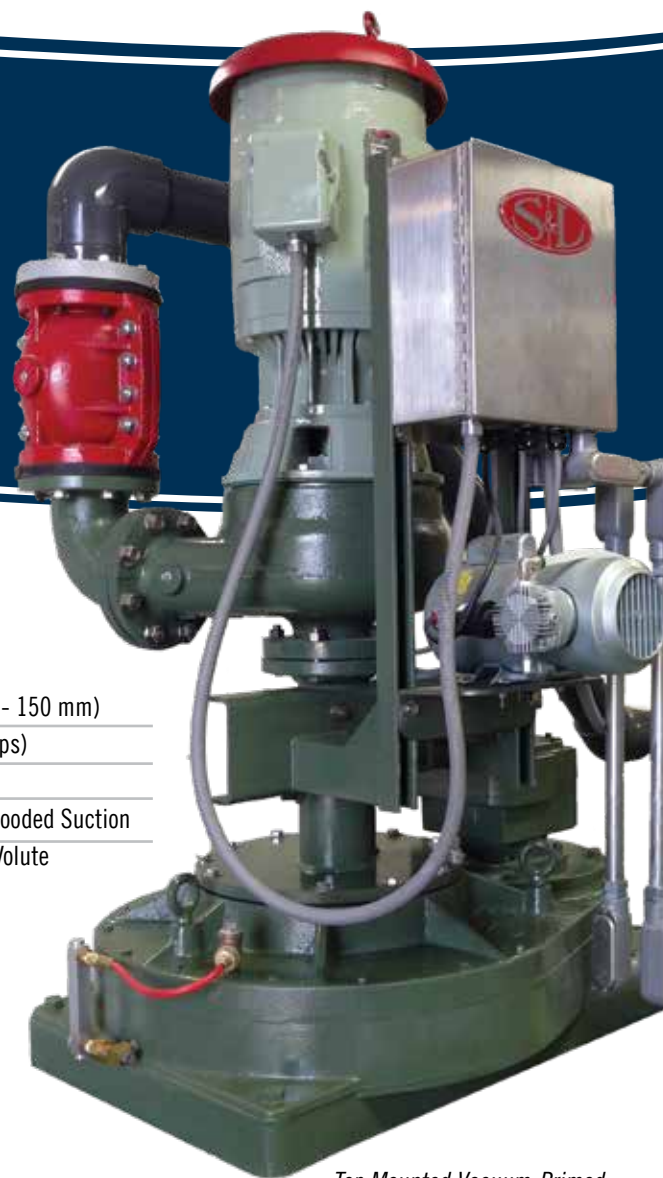
# PISTA® TURBO™ Grit Pump

Smith & Loveless' rugged PISTA® TURBO™ Grit Pump is the only pump in the industry exclusively designed for pumping grit separated from sewage. Available in both top-mounted vacuum-primed and remote-mounted flooded-suction configurations, the grit pump features the exclusive staples of S&L wastewater pump design: an oversized, stainless steel shaft and oversized bearings. The pump utilizes a single mechanical seal, which eliminates the need for seal water filter system. Top-Mounted units eliminate expensive piping while lowering the head and horsepower requirements. This combination yields reliable grit pumping and the velocity required for effective grit washing and dewatering devices. The pump is available in both 4" and 6" (10.1 and 15.2 cm) piping arrangements.



## Features & Benefits

- Direct coupled design
- Ni-hard construction (nickle-based alloy)
- Durable, recessed impeller reduces plugging
- Oversized bearings and stainless steel shaft
- Heat dissipating bronze seal housing
- Top-mounted and remote-mounted models for design flexibility



Top Mounted Vacuum-Primed Turbo Grit Pump



### Product Data

Sizing:	4" - 6" pumps (100 - 150 mm)
Capacity:	Up to 500 GPM (32 lps)
Horsepower:	1.5 - 40 HP
Type:	Vacuum Primed & Flooded Suction
Materials:	Ni-Hard Impeller & Volute

Remote-mounted, Flooded Suction Turbo Grit Pump

## Complete System Packages

Further enhancing the world's best grit removal scheme in a environment-protected, factory-assembled package, Smith & Loveless introduces the **PISTA® PRO-PAK™**. The custom-engineered **PISTA® PRO-PAK™** features a factory-assembled **PISTA®** drive assembly, vacuum priming system and controls mounted to a steel base and housed within a retractable fiberglass enclosure. The drive motor, pump and related

components are factory pre-wired and mounted to the base, all to minimize and expedite field installation.



### Features & Benefits

**PRO-PAK™** is pre-assembled & shipped to job site for easy installation

Ideal for cold weather climates, eliminates the need for a building

**PISTA®WORKS™** is a complete headworks system on one easy-to-ship skid

Includes **OBEX™** & Inlet fine screen, **PISTA® 360™** with **V-FORCE BAFFLE™**,

**PISTA® TURBO™** Grit Washer and **PISTA® TURBO™** Grit Pump

The **PISTA®Works™** is Smith & Loveless's most recent innovation further enhancing the world's best headworks and grit removal scheme all in one package, providing many engineering and cost savings considerations.

The **PISTA®Works™** is a complete system design that allows for significant flow variations (patented **V-FORCE BAFFLE™**), has a compact footprint, and provides a speedy and efficient installation. As with all Smith & Loveless products, **PISTA®Works™** delivers the lowest life-cycle costs, is made in the USA, and all the equipment is of stainless steel construction for years of dependable service.

## PISTAWORKS™

*Models include capacities for 0.5 MGD (1,890 CMD) to 7.0 MGD (26,5000 CMD)*



## PISTA VIO™

The newest innovation in forced hydraulic grit removal provides unprecedented design flexibility to go along with industry-leading removal efficiencies. The **PISTA® Vio™** Grit Removal System can be designed with the inlet and outlet channels at any variable angle up to the full 360° of the chamber—offering simple installation into existing sites or an efficient footprint for new sites. With the use of an innovative hydraulically forced ring and

tunnel system, the **PISTA® Vio™** creates the vortex flow path necessary to provide industry-leading 95% grit removal down to 140 mesh / 105 microns.

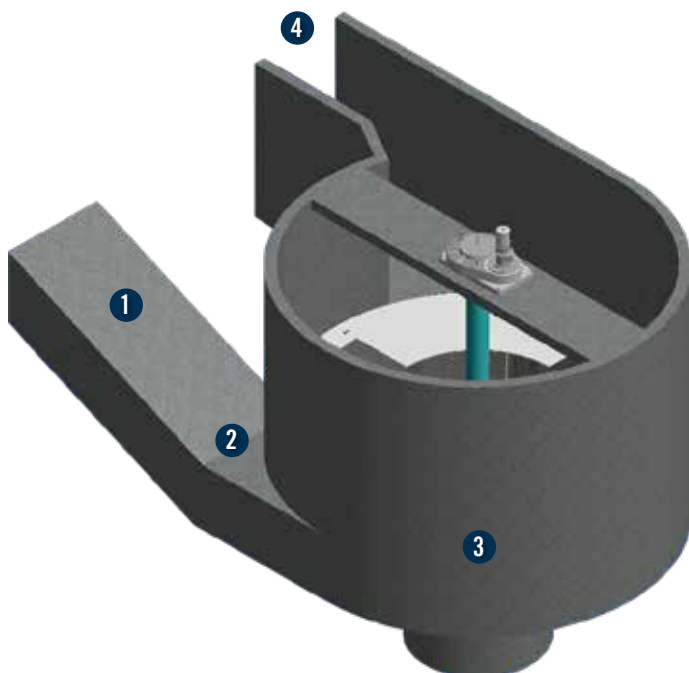
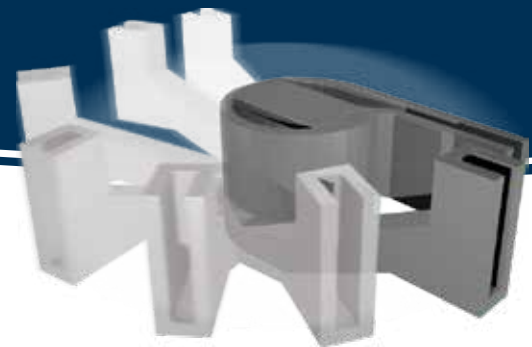
### Features & Benefits

Flow maximizer baffle & tunnel system creates effective vortex flow pattern

95% grit removal efficiency down to 140 mesh particle size (105 microns)

Design inlet and outlet channels at any variable angle up to the full 360° of the chamber

Effluent flume counteracts the weir effect, reducing grit bypass



- 1 Influent Flume**  
Directs the flow towards the wall of the chamber to promote vortex movement and the necessary velocities
- 2 Underdrive**  
Grit siphon increases influent flow velocity, in low flow applications, keeps grit on inlet floor.
- 3 Axial-flow Propellers**  
Redesigned axial-flow propellers have been improved to create better lift in the deeper chamber.
- 4 Effluent Flume**  
Designed to minimize the harmful weir effect that can contribute to grit bypass in these types of systems.

# PISTA 360™

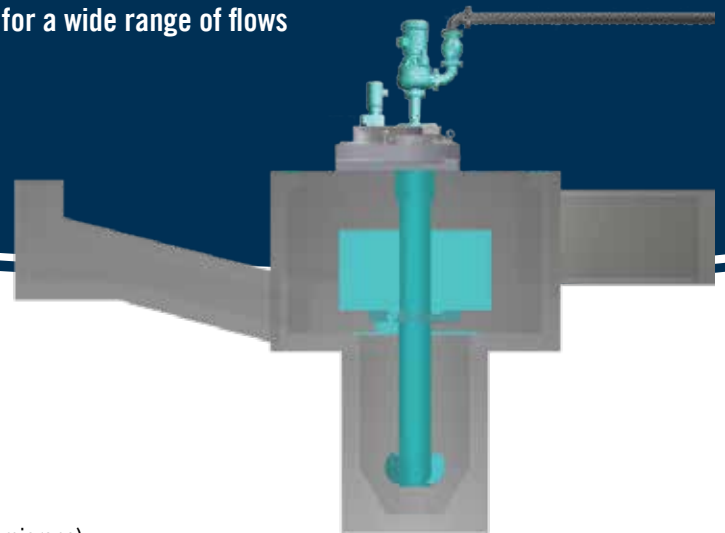
WITH V-FORCE BAFFLE™

With more than 2,600 installations world-wide, the **PISTA® 360™** Grit Chamber is equipped with the patented **V-FORCE BAFFLE™**, which is an integral flow control baffle for both the inlet and outlet of the main chamber. The **V-FORCE BAFFLE™** is designed to direct the inlet flow into the chamber in a manner ensuring the proper vortex flow and to prevent short-circuiting, allowing for a full 360° rotation through the inlet and outlet, providing maximum travel for the most effective grit removal.

The **V-FORCE BAFFLE™** on the outlet directs the flow out of the unit and acts as a “slice weir” to control the water level in the main chamber and in the inlet channel. No additional downstream flow control device is required to keep the velocity between 3.5 fps (1.1 m/s) at peak flow and 1.6 fps (0.5 m/s) at minimum flow providing a 10:1 turn down.

## Features & Benefits

- 95% grit removal efficiency down to 140 mesh particle size (105 microns)
- Construction cost savings due to decreased footprint requirements
- Increases grit chamber velocity during low-flow periods, designed for a wide range of flows
- Full 360° rotation in the chamber, lengthening grit extraction path
- Eliminates the need for downstream level control devices
- Designed to handle wide range of flows



## Product Data

Unit Capacities:	0.5 mgd - 100 mgd (1,892 cmd - 378,5000 cmd)
Arrangements:	360° w/ V-FORCE BAFFLE™
Chamber Construction:	Concrete or steel
Removal Efficiency:	95% grit removal efficiency down to 140 mesh (105 microns)
Pump Sizes:	4" (100 mm) and 6" (150 mm)
Pump Arrangements:	Top-Mounted & Remote-Mounted





The **OPTIFLOW 270™** Baffle System brings previously unachieved grit removal efficiencies to new or existing **PISTA® 270™** Grit Chambers and 270 degree grit chambers by others. It improves grit removal from 65% of 100 mesh (150 micron) grit and 85% of 70 mesh (210 micron) to 95% of 100 mesh (150 micron) during peak and low flows alike.

The **OPTIFLOW 270™B** baffle fits inside any 270 degree grit chamber at the exit, directing the flow toward the hopper for

an additional pass along the flat-bottomed chamber floor for increased grit removal. This revolutionary baffle reduces the weir effect at the outlet, keeping fine grit within the chamber and improving the toroidal flow path within the **PISTA®** Grit Chamber. The **OPTIFLOW 270™LFB** baffle is installed on units where the lowest flow rate is below 60% of the design rate. This inlet channel baffle maintains influent velocities to provide proper entry velocity into the main chamber vortex.

## Features & Benefits

Increase grit removal efficiency up to 95% down to 100 mesh particle size (150 micron)

Maximize grit capture, improve vortex pathways and enhance toroidal flow path

Handle large flow variations with a single **PISTA® 270™**

Simple retrofit options for all types of 270° vortex grit chambers



### 270™ B

The **270™B** Exit Baffle is the essential component to every **OPTIFLOW 270™**. It increases grit removal efficiency to 95% down to 100 mesh (150 micron) on 270 degree grit chambers from any manufacturer. Each baffle is custom engineered based on flow rate to achieve 95% of 100 mesh (150 micron). Installed within the chamber at the exit, the **270™B** directs the flow for an additional pass along the flat bottomed chamber floor for greater grit removal.

### 270™ LFB

The **270™LFB** Low Flow Baffle is installed on most units. Each baffle is custom engineered based on flow rate to achieve 95% of 100 mesh (150 micron). Bisecting the influent channel, this baffle makes it possible for your existing unit to handle a wider range of flows while maintaining optimum channel velocity of 2 to 3.5 ft/sec for grit transport with minimum turbulence, and to provide the proper entry velocity into the main 270° grit chamber.

### 270™ STF

The **270™STF** Slope-To-Flat Chamber Floor Conversion is necessary only for non-**PISTA®** circular grit chambers constructed with a sloping chamber floor.

To ensure the efficient transport of grit and simultaneous lifting and discharge of organic material, the bottom of the chamber must be at a constant flat elevation. An **OPTIFLOW 270™STF** adapter baffle ring will be added, and the chamber floor will go from Sloped To Flat to create the toroidal flow path within the chamber.

# Leading by Example Through R&D



*At the Smith & Loveless Grit Removal Research Center (GRRC), visitors see first-hand how CFD Analysis and actual hydraulic vortex grit removal come together. The GRRC is the only R&D facility of its kind in the wastewater industry.*

Smith & Loveless' new Grit Removal Research Center (GRRC)—the first of its kind in the industry—is now open to the visiting public and features a fully functional 4.0 MGD (15,000 CMD) Grit Removal System for the purpose of advancing S&L's grit research, developing and displaying grit removal technologies and improving grit testing services.

Schedule your visit today to learn all about grit, the affect it has on wastewater process basins and collection

systems, as well as S&L grit removal product offerings. See real grit flow paths and patterns, and simulate the actual conditions of your installation with the help of a product expert (and the variation of flow rate, velocity, grit characterization, grit loading, etc).

For S&L's internal use, the GRRC will be an invaluable tool for advancing research, developing and displaying products and improving services.

