Vortex Flow Insert

A new solution for is the IPEX Vortex Flow Insert (VFI), a revolutionary technology for eliminating odorous emissions and minimizing corrosion in vertical sewer drops. With no moving parts and requiring no virtually maintenance, VFIs have delivered significant cost savings in installations across North America.



The VFI's patented spiral flow design eliminates odorous and corrosive gases in a unique way. It uses the wastewater's own flow energy to suppress the turbulence which releases noxious gases. The spiral flow creates a downdraft which traps airborne gases and forces air into the sewage flow to oxidize odorous gases. By installing a Vortex drop structure, municipalities can save thousands of dollars in monthly chemical feed, air-phase treatment and maintenance costs.

APPLICATIONS

Manholes, Chambers and Forcemains

Pumping Station Wet Wells

Steep Grade Sewers

Turbine discharges

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Inserts for Sewer Odor and Corrosion Control











We build tough products for tough environments®

VORTEX FLOWTM

A SIMPLE SOLUTION FOR ODOR AND CORROSION CONTROL

ydrogen sulfide (H₂s) gas and other odorous gases are a fact of life with sanitary sewer drop structures. When these gases become airborne, they not only generate complaints from the neighborhood, but also impact air quality and cause corrosion within the sewer system. Municipalities spend millions on various forms of odor and corrosion control, yet many of these methods are only partially successful and require a considerable amount of maintenance and chemicals.

A new solution for municipalities is the IPEX Vortex Flow Insert (VFI), a revolutionary technology for eliminating odorous emissions and minimizing corrosion in vertical sewer drops. With no moving parts and requiring no maintenance, VFIs have delivered significant cost savings in installations across North America.

The VFI's patented spiral flow design eliminates odorous and corrosive gases in a unique way. It uses the wastewater's own flow energy to suppress the turbulence which releases noxious gases. The spiral flow creates a downdraft which traps airborne gases and forces air into the sewage flow to oxidize odorous gases. By installing a Vortex drop structure, municipalities can save thousands of dollars in monthly chemical feed, air-phase treatment and maintenance costs.

In addition, land developers can save hundreds of thousands of dollars in excavation costs in areas where conventional drop structures are not allowed.

BUILT-TO-SPEC FOR ANY SIZE

Manholes, chambers and pumping stations are built in a variety of sizes. For that reason, IPEX custom designs and custom builds every Vortex Flow Insert. The Vortex drop height can be as little as 5 feet or more than 100 feet tall. Shop drawings are prepared and submitted to the customer, and each phase of the project is tightly-controlled to ensure the project's success.

IPEX VFIs are sized based on the peak flow that the unit is required to handle. The insert can be installed in a standard manhole without restricting access for maintenance.



Flow is accelerated to Supercritical

Influent Line



HOW IT WORKS

VORTEX TOP FORM

The wastewater flows into the Vortex Top Form which directs the flow around a channel of decreasing radius. At the same time, the Vortex channel slopes downward to accelerate the wastewater to a supercritical velocity.

VORTEX DROP SHAFT

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Once the flow is channeled into the smaller Drop Shaft, the velocity and centrifugal forces generated within the VFI cause the flow to hug the inside walls of the Vortex Drop Shaft. This spiraling flow creates a negative air core, which draws airborne gases down the Drop Shaft to the Energy Dissipation Pool. Frictional forces created within the Vortex Drop Shaft assist in dissipating the fluid energy.



ENERGY DISSIPATION POOL

The flow exit is submerged in the Energy Dissipation Pool at the bottom of the Vortex. Air and gases drawn down the air core are forced back through the wastewater and are re-entrained into the flow. This significantly increases the dissolved oxygen concentration in the wastewater, and the re-entrained odorous compounds are then quickly oxidized.





WINNER OF THE APWA TECHNICAL **ACHIEVEMENT AWARD**





Vortex Top Form

Vortex Top Cut

Vortex Channel

Vortex Drop Shaft

Flow Exit

Energy Dissipation Pool hile Vortex Flow Inserts leave manholes and pumping stations smelling better, they can also make a land developer's job easier and less costly. Due to the odor and corrosion problems of conventional drop structures, many municipalities have banned them altogether. Until now, the only alternative available to land developers was to install sewers with a gradual grade to trunk sewers deep underground, a practice which can cause the cost of excavation to skyrocket.

But by installing Vortex Drop Structures (drop structures with Vortex Flow Inserts), land developers can now comply with municipality concerns and save thousands, if not millions, in excavation costs. No wonder developers across North America are taking advantage of this revolutionary technology.

HOW VORTEX FLOW CAN SAVE MUNICIPALITIES MONEY



REDUCED CORROSION EXTENDS SEWER LIFE

Hydrogen sulfide (H_2s) emissions from forcemain discharges can literally eat through a concrete drop manhole. By oxidizing dissolved H_2s , a Vortex Flow Insert in a municipal sewer drop can significantly reduce concrete and metal corrosion, extending sewer life and saving the municipality money.



ELIMINATES ODOR TREATMENT COSTS

By increasing dissolved oxygen levels in wastewater and oxidizing sulfides and other odorous compounds, the use of a Vortex Flow Insert in a drop structure eliminates the need for costly chemical injection, high-maintenance biofilters and air scrubbers.



IMPROVES WASTE WATER QUALITY

Because a Vortex drop structure reduces the odorous and corrosive elements in the flow, a Vortex Flow Insert, installed upstream of a treatment plant, can actually improve wastewater quality prior to treatment, reducing treatment costs at sewage plants.



REDUCED MAINTENANCE COSTS

The use of a Vortex drop structure eliminates the corrosion of concrete and metal sewer components, dramatically reducing municipal maintenance costs of manholes and sewers.

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Frank A. Badinski, C.E.T., Asset Management Coordin Regional Municipality of Yo NAAPI Chair; NASTT Great Lakes St. Law



SAVINGS

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vrence and Atlantic Canada Vice-Chair.





Manholes, Chambers and Forcemains – Wherever you have a drop from one pipe to another, Vortex drop structures can transform drop manholes from potential maintenance problems into effective aeration devices that control odor and corrosion.



Pumping Station Wet Wells – A Vortex drop structure can minimize gas emissions from pumping station wet wells.



Steep Grade Sewers – Vortex Flow can dissipate the flow energy of water running down a steep grade, reducing the flow's discharge speed.



Turbine Discharges – By dramatically reducing the flow energy of water through turbine discharges, Vortex Flow helps to reduce the environmental disturbance when the flow is released into rivers and lakes.



VORTEX FLOW INSERT

DESIGN INFORMATION



CONCEPTUAL DRAWING



IT'S A SIMPLE WAY TO ELIMINATE SEWER ODOR EMISSIONS



PRODUCTION



Fabrication of a 60 MGD Vortex unit Austin, Texas.



Hydrostatic testing of a large Vortex unit.



Shipping from fabrication plant, Mississauga, Ontario.

INSTALLATION



Offloading a Vortex Top Form.



A uniquely flanged Vortex, Vancouver, British Columbia.



Vortex with a flanged entrance, Manassas, Virginia.



Vortex Top Form to be secured to structure, Alexandria.



Strapping detail on Vortex unit, Buckeye, Arizona.



Securing Vortex Flow unit, Burlington, Kentucky.



Vortex unit being strapped and adapted to inlet pipe.



Vortex Flow operating in a pumping station wet well, Jacksonville, Florida.



Vortex Flow Insert reducing H₂S concentration levels, Camden County, New Jersey.