



W E L C O M E

TO *Fabulous*

**NOZZLES**

THE DIRTY TRUTH



of Sewer  
Cleaning"  
By  
Tray Hall

"History of Sewer  
Cleaning"  
By  
Tray Hall





*Flexible*

**SEWERODER**

**FLEXIBLE INC.**

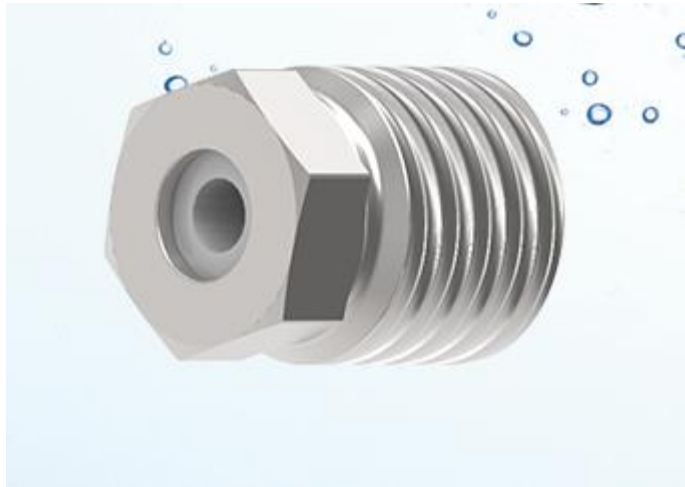
HYDRAULIC

12801

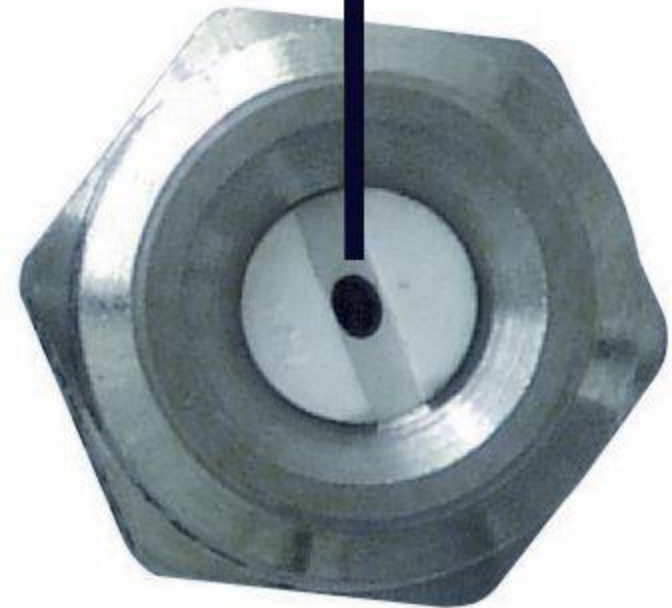


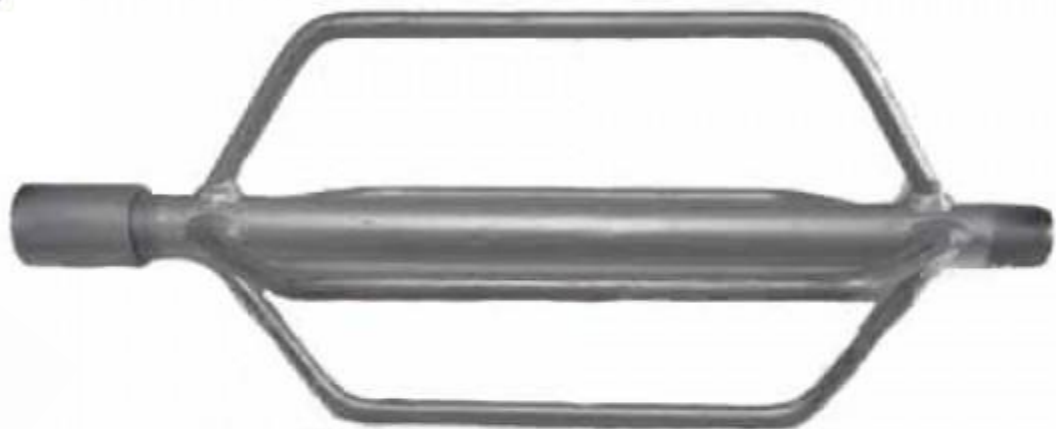
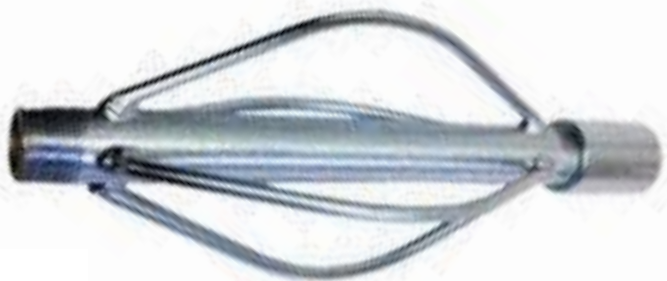






**CERAMIC**











*Foreign Object*



*Misaligned (separated)*



*Belly*



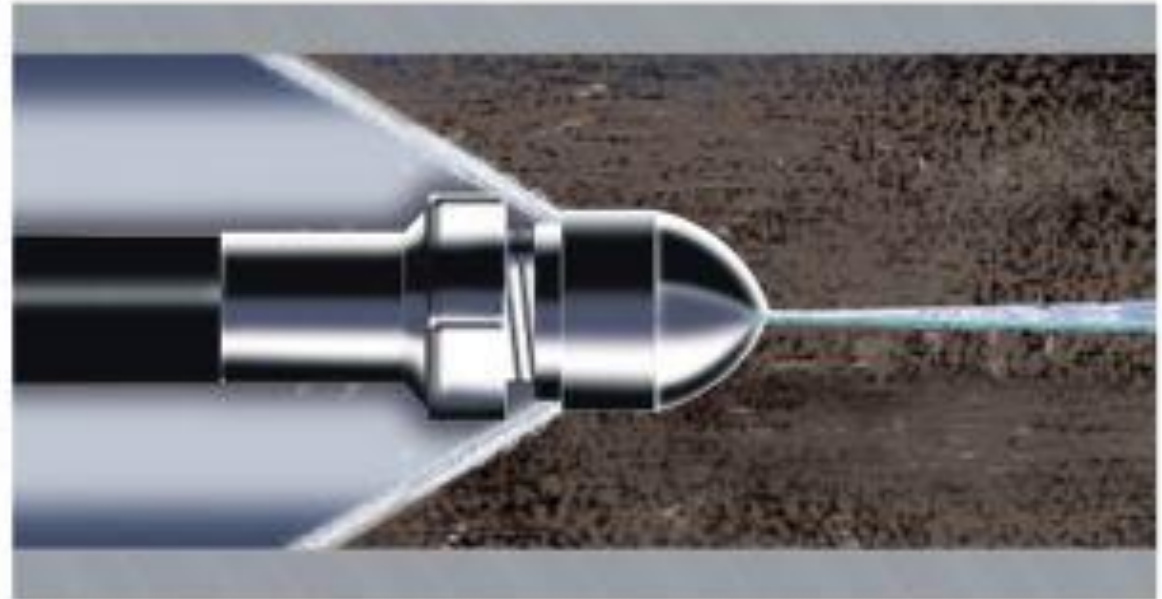
*Collapsed*







Preventative Maintenance



### **Egg, Standard ect.**

Is typically light weight ranging from a 1/2 Lbs. for a 1/2" nozzle to about 3 3/4 Lbs. for a 1" nozzle and is a good choice for "preventative" maintenance lines coupled with a skid.







Preventative Maintenance



## The Ice Cream Cone or the Rocket

This nozzle is used to “fly” up the line generally cast alum. This nozzle is typically light weight and has nozzles at the back at 10 or 11 degrees allowing for maximum thrust.



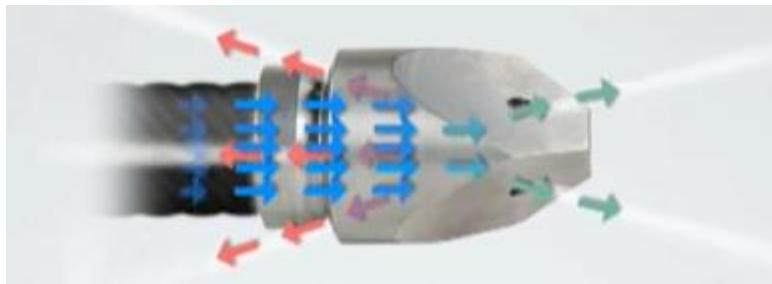




Grease, Fats

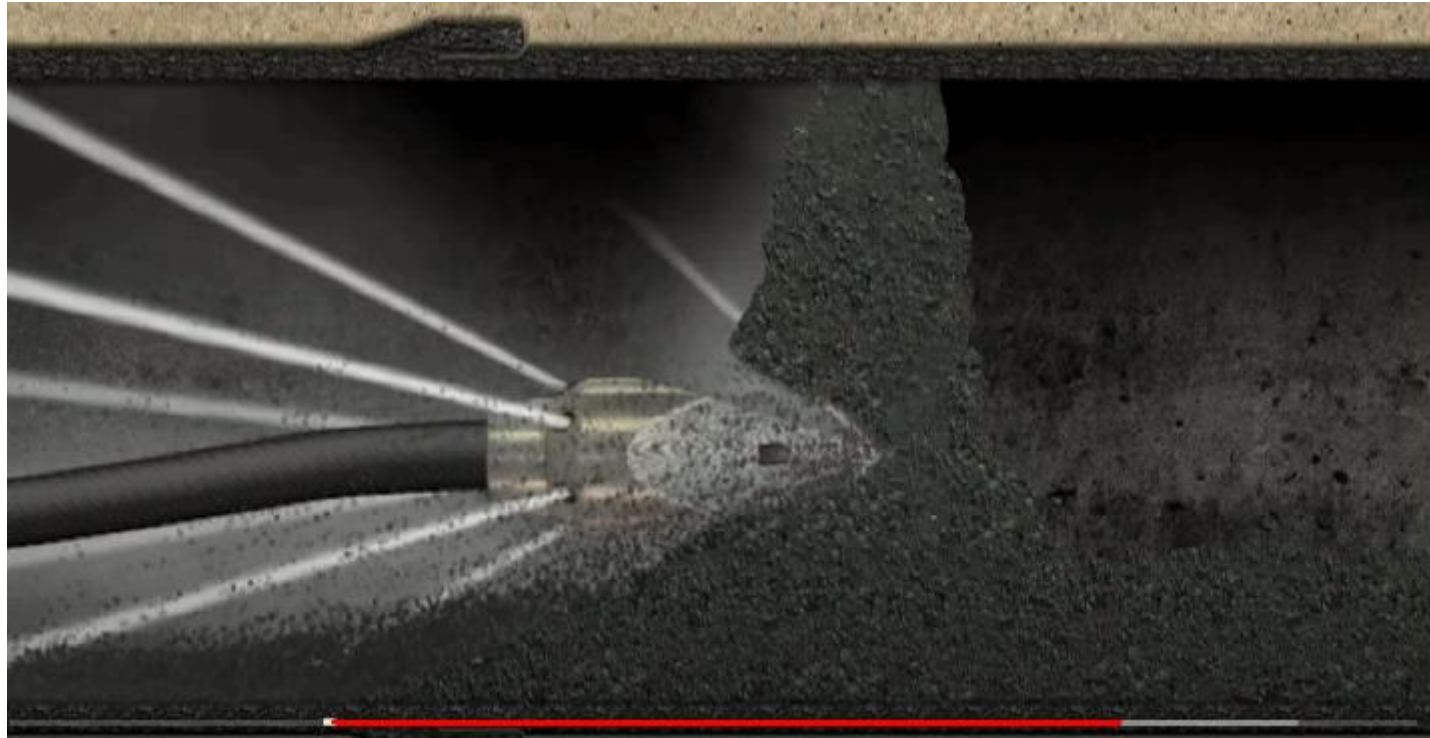


Roots



The **Chisel Nozzle** is a reliable sewer cleaning nozzle that is a must have! Sharp edges and multiple forward jets deliver powerful penetration to effectively open tough total blockages. A drill point can be added to the front of the Chisel as well.





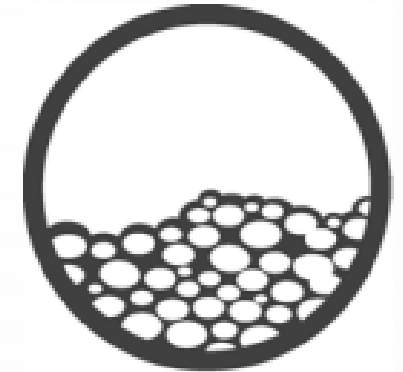




Grease, Fats



Preventative Maintenance



Large Debris, Rocks, Mud, Sand, Silt

### **Bomb, Grenade ect,**

Ranging in weight from 2 ½ Lbs. to Over 40 Lbs. These styles of tools can be made to climb, jet and spray, can put allot of water in the pipe and can drag out large debris.



jet angle 30° – 35°



jet angle 15° – 20°



jet angle 10°







**Multi-angled inserts and rear propulsion jets remove and flush debris**

**Rotor Nozzles** feature three one-piece ceramic inserts in the middle rotating section with spray angles of 90° /75° /60°, effectively removing grease, dirt and light roots from pipes. Rear propulsion jets help flush the debris. Constructed of hardened stainless steel, the nozzles include non-corrosive, low-maintenance rotating centers.

Preventative Maintenance









Roots

## Pipe Wolf, Drilling Cutter

Extremely aggressive specialty tool perfect for total blockages that are made of organic material. A hardened, tapered head with sharp edges utilizes turbine technology and spins approximately 10,000 rpms, boring a hole and opening the blockage.







Roots



Grease, Fats



Preventative Maintenance



Large Debris, Rocks, Mud, Sand, Silt



### **A user-friendly, innovative nozzle that flushes out debris**

Designed for controlled rotation and use with recycled water, the innovative **Primus** requires no lubrication or replacement of internal parts for at least one year. The nozzle is built from hardened stainless steel. A rotating head removes grease, light scale and roots. And the 3D fluid mechanics in the propulsion unit flush out debris, providing outstanding results.





Roots



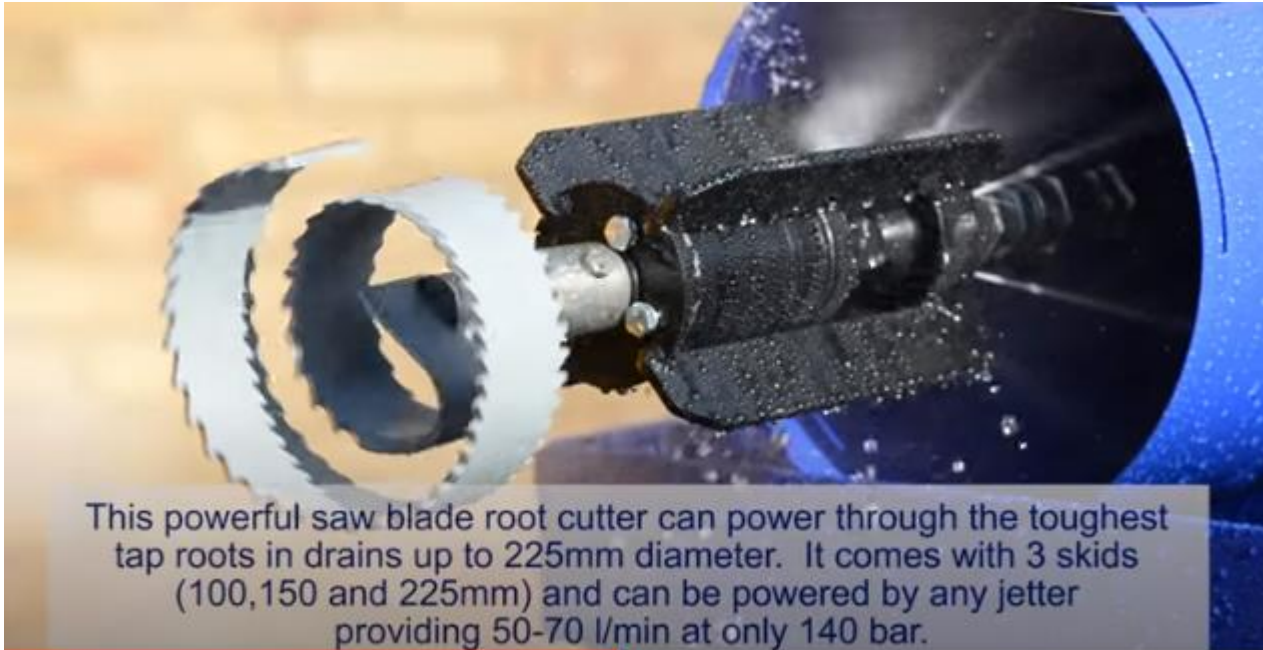
Preventative Maintenance

High Torque, Low RPM

### Hydraulic Root Saw

These tools offer High Torque and low RPM and can cut the toughest tap roots. I have also learned that they can be an awesome proofing tool.

The “Root and Grease Cutter” Assembly is capable of developing pressure and torque to remove the most difficult stoppages from pipes 4" to 20" in diameter. This patent pending unique design combines both rollers and skids to stabilize and roll the root cutter up the pipe with minimal friction. Less water is used, more roots are cut, and fewer trips are made to the fire hydrant which means more productive sewer cleaning.



This powerful saw blade root cutter can power through the toughest tap roots in drains up to 225mm diameter. It comes with 3 skids (100, 150 and 225mm) and can be powered by any jetter providing 50-70 l/min at only 140 bar.





Large Debris, Rocks, Mud, Sand, Silt



**Bulldozer, Surge ect.** These nozzles are great for large diameter pipes. They produce an intense and forceful jet pattern resulting in outstanding excavation, traction and transportation of material, even under water.





Front push rotor nozzle



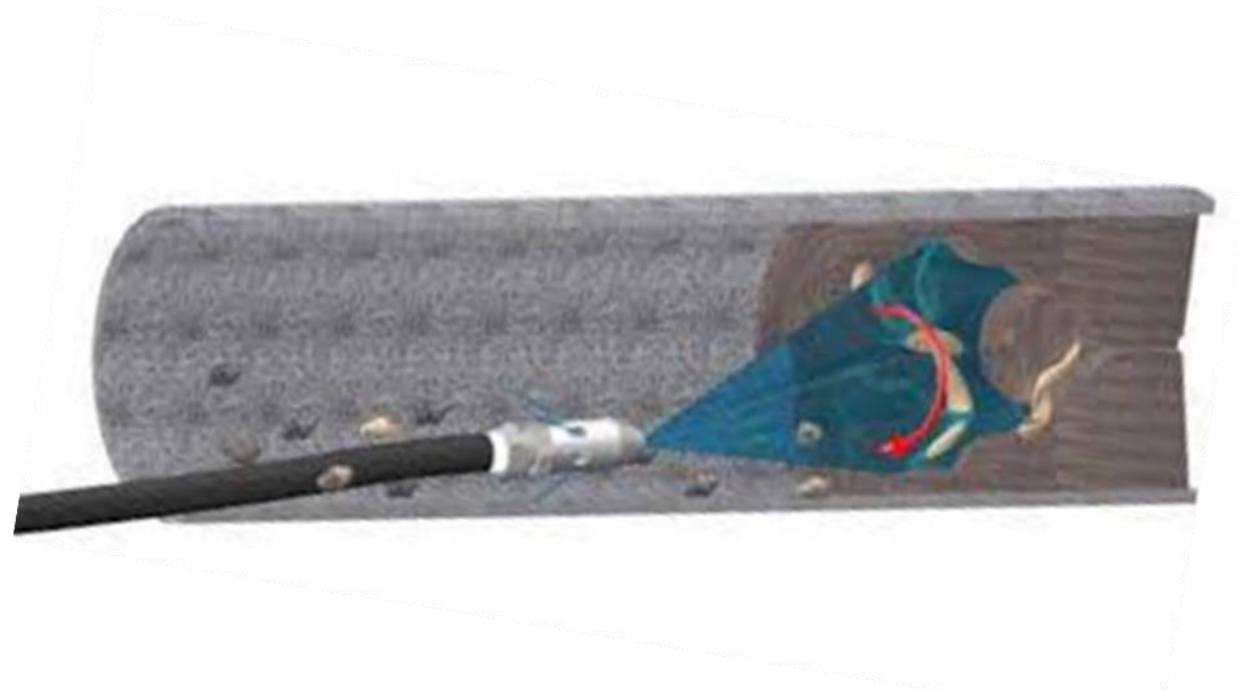
Large Debris, Rocks, Mud, Sand, Silt

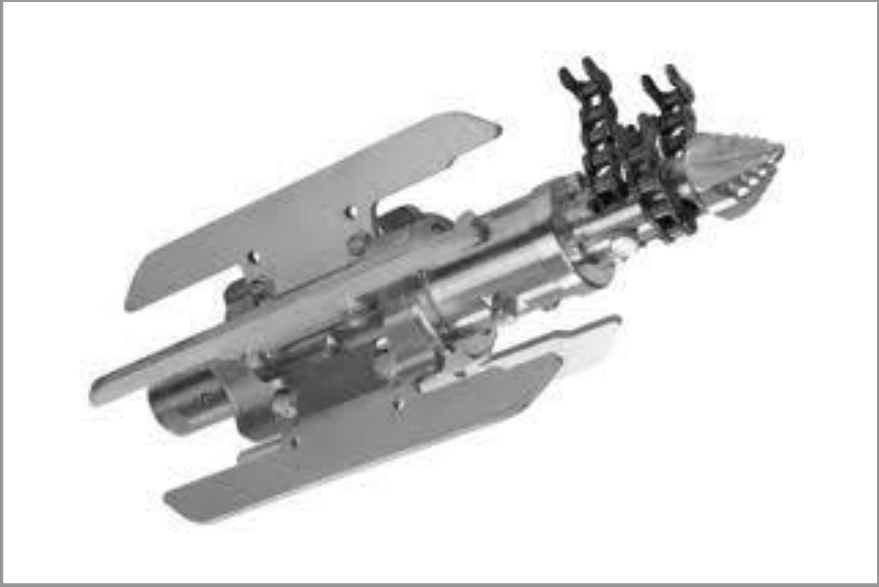
**A front-pushing nozzle designed for laterals and small pipes**

The stainless steel **Front Push Rotor nozzle** is designed for effective cleaning of laterals and other small pipes. Rear jets propel the nozzle in the pipe, front rotating jets move material forward and additional rotating radial jets thoroughly clean the interior circumference of the pipe.



MORE VIDEOS









Roots

High RPM Low Tourqe.

## **Chain Cutter, Turbo, Lumber Jack**

These heavy-duty cutters use turbine technology in combination with fluid mechanics to deliver cutting performance . Roots, grease, mineral deposits and protruding taps.



T-Hammer, Jitter Bug, Ect.

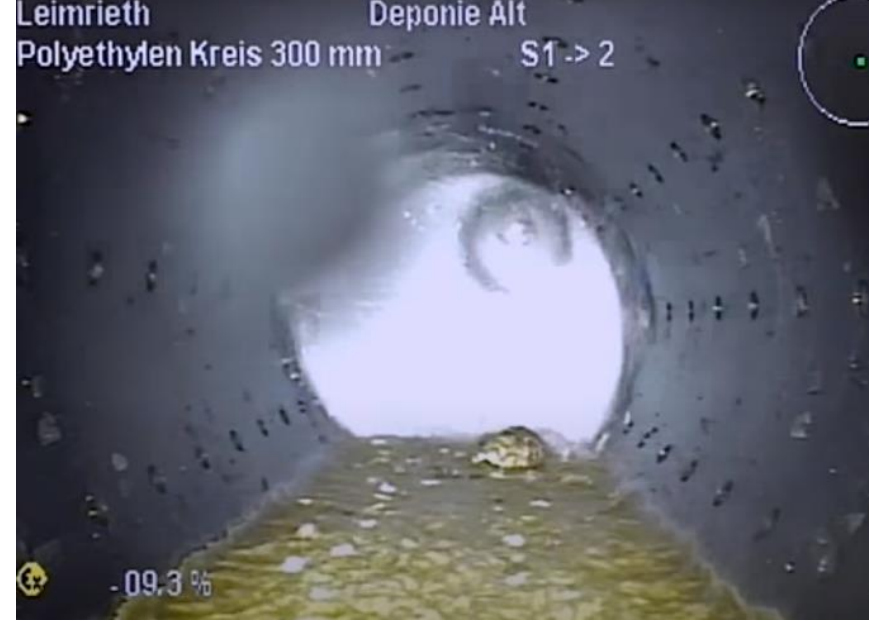




Mineral Deposits, Calcium, Scale

The **T-Hammer**'s middle rotor section generates vibration in plastic pipes to break up deposits and other hard materials. Turbine technology controls the agitation. This stainless steel nozzle can be used with recycled water and comes standard with one-piece ceramic inserts.

**WARNING: Use in thick plastic pipes only!! NEVER use in clay, concrete or thin plastic pipes**



## Bernoulli principle or Venturi effect



Large Debris, Rocks, Mud, Sand, Silt

### Clean large sewer pipes with continuous flow

USB has designed a specialized nozzle to clean large sewer pipes with continuous flow. The **Venturi Nozzle** creates a constriction within the pipe that varies the flow of fluids (the Venturi effect), enabling it to clean and move large volumes of sand, mud, sludge, gravel and other debris out of the pipe. The Venturi nozzle comes standard with a high-pressure swivel. Available in two models.

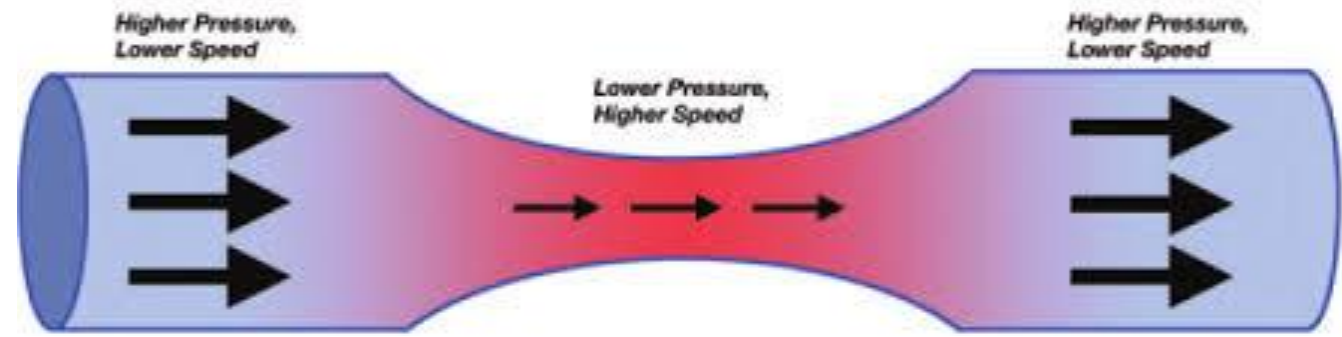
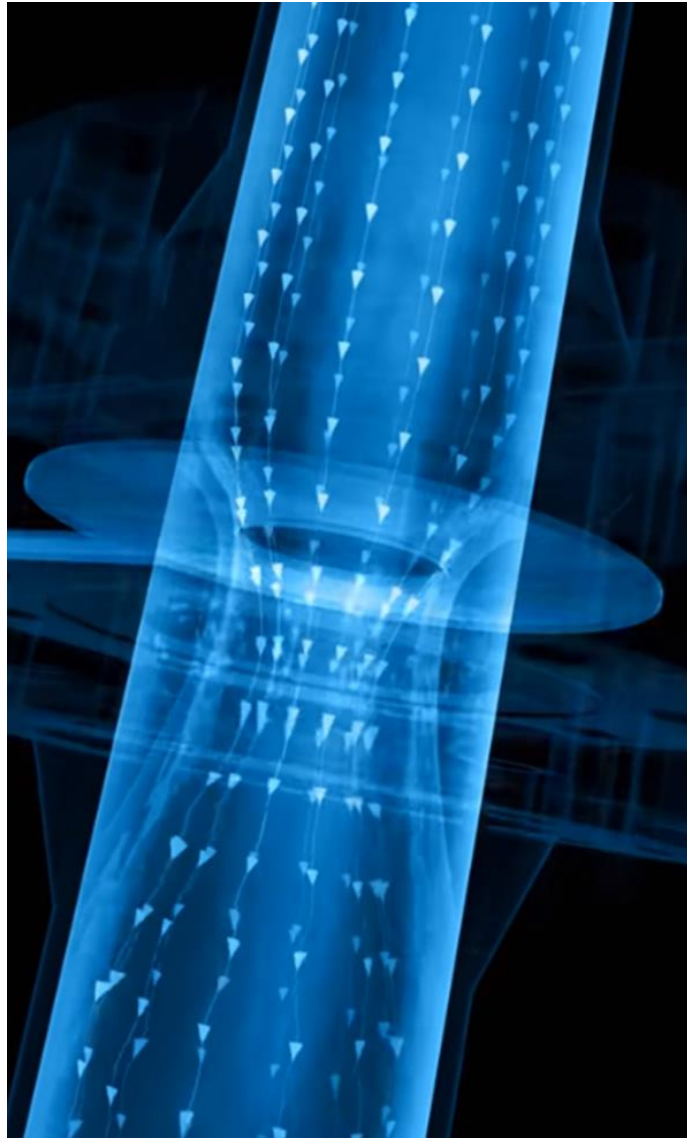
**NOTE: The nozzle must be completely submerged in water when operating.**



2700







Energy per unit volume before = Energy per unit volume after

$$P_1 + \frac{1}{2}\rho v_1^2 + \rho gh_1 = P_2 + \frac{1}{2}\rho v_2^2 + \rho gh_2$$

Pressure Energy

Kinetic Energy per unit volume

Potential Energy per unit volume

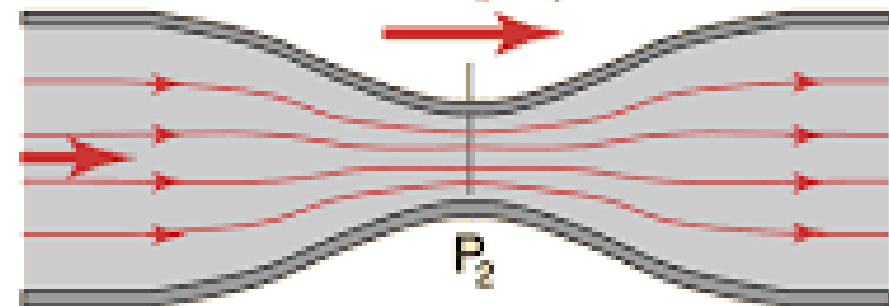
The often cited example of the Bernoulli Equation or "Bernoulli Effect" is the reduction in pressure which occurs when the fluid speed increases.

Flow velocity

$v_1$

Flow velocity

$v_2$



$$A_2 < A_1$$

$$v_2 > v_1$$

$$P_2 < P_1!$$

Increased fluid speed,  
decreased internal pressure.



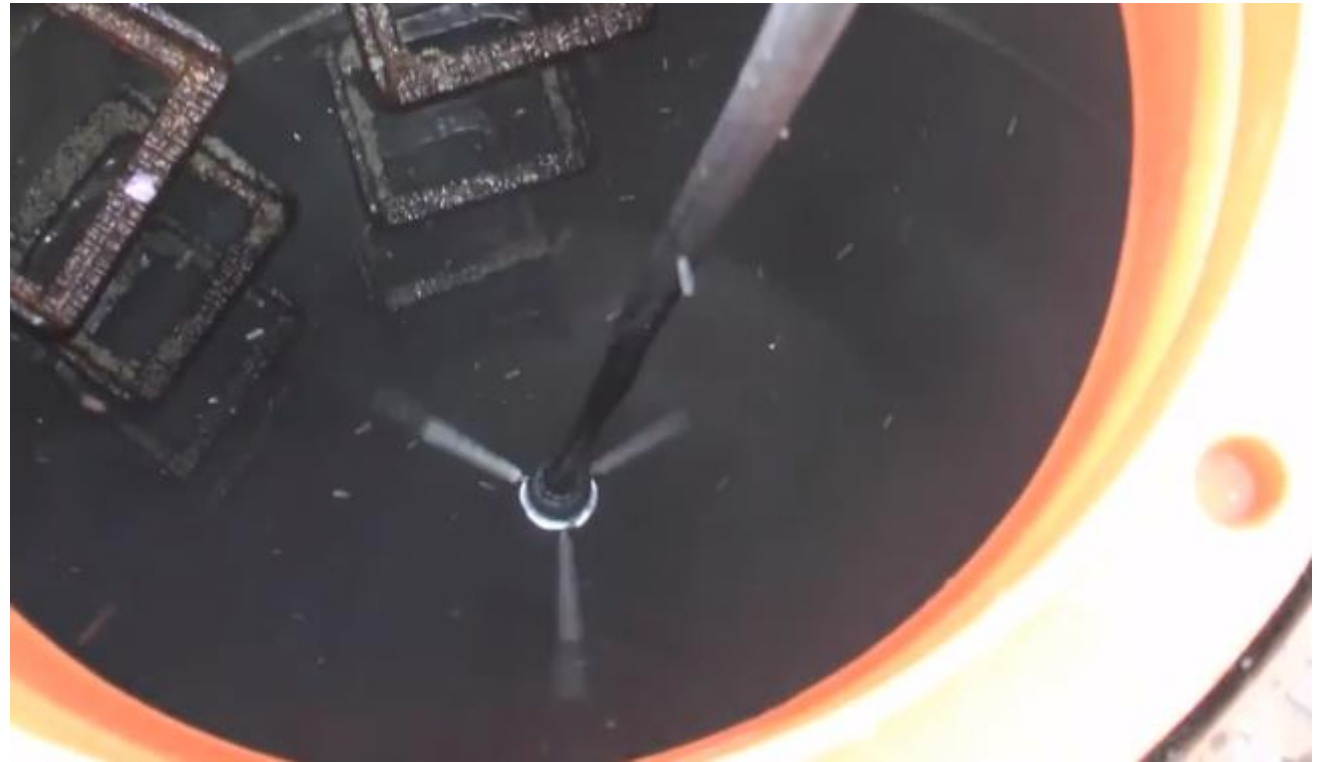
## Spin-Jet

### **A controlled, rotating nozzle for cleaning lift stations, barrels and manholes**

The **Spin-Jet** is a self-centering, controlled rotating nozzle that is used for cleaning lift stations, barrels and manholes prior to rehabilitation. Available in two different versions, the Spin-Jet has driving nozzles that rotate in a 360° horizontal plane only. This action eliminates the need to cover the manhole during operation, allowing for constant viewing of the cleaning process. Front jets thoroughly clean any grease, sludge or mud at the bottom.



Manholes



## Jet Cam, Nozz Cam ect.

These are amazing tools to have and can give the operartor a quick look into the pipe on the spot.





Preventative Maintenance



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