

COANDA Grit Washer RoSF 4



For production of clean grit:

- below 5 % organics and 10% water
- reusable, e.g. for road or sewer bedding
- passing paint filter test
- virtually odorless, no insect attraction
- minimized weight, volume and disposal costs

➤➤ Grit: Polluted waste or useful product

Grit from grit chambers, even after conventional classifying, has a high organic content and is polluted waste.

European regulations permit landfilling of waste only, if its organic content is below 5 %. Such a requirement does not exist in America – not yet.

Independent of regulatory requirements, American operators of wastewater treatment plants also like to produce clean and virtually odorless grit that does not attract disease conveying insects. In addition, well-washed and almost dry grit has far less weight, which in turn permits considerable disposal cost savings.

Well washed grit can be used as construction material, e.g. for road bedding. Some of our American customers supply their clean grit for landfill covering.

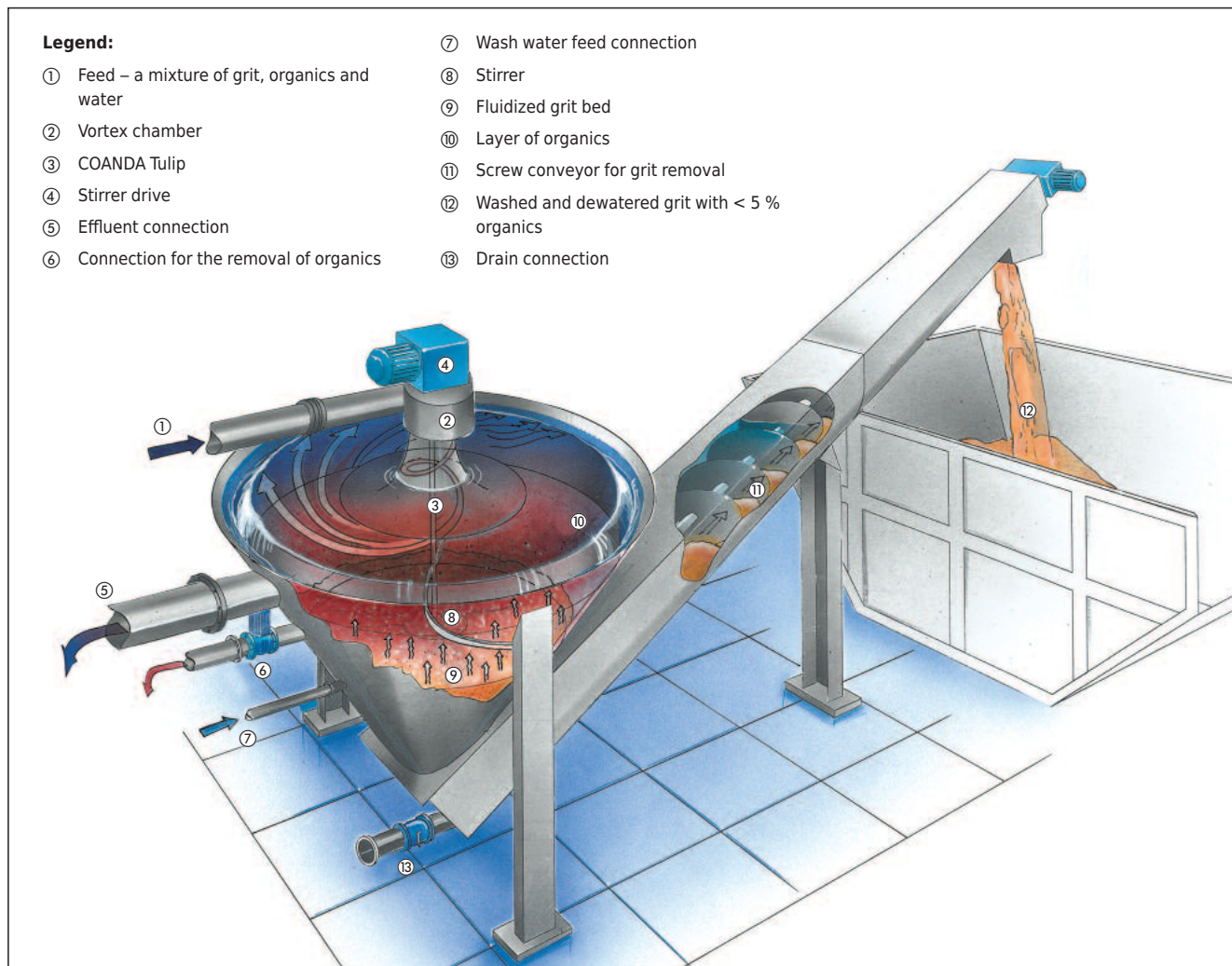
➤➤ Our Challenge

To produce grit with less than 5 % organic content, we have developed our COANDA Grit Washer RoSF 4. This sophisticated grit washer, combines in a single unit, the conventional functions of grit classifying, conveying and dewatering with a highly effective grit washing process.

➤➤ Applications

Grit Washers can be fed with:

- grit / water mixture from grit traps or chambers
- pre-treated grit from grit classifiers
- waste from gully evacuation or sewer flushing, or road sweepings.



►► COANDA and fluidized bed effects

Our COANDA Grit Washer RoSF 4 classifies and washes grit in a single and compact unit. It combines excellent separation efficiency with outstanding washing performance.

COANDA effect for excellent grit classifying

A mixture of grit, organics and water is fed through a vortex chamber where a fast spinning rotational movement is generated. The mixture then flows down through a trumpet-shaped COANDA tulip. The flow is diverted along the curved inner surface of the COANDA tulip by the COANDA effect (a liquid flow adheres to the contour of a curved surface). The flow is diverted smoothly, without generation of eddies, from a fast rotating vertical direction to a gradually slower rotating horizontal direction. The water flows evenly in a relatively thin layer below the water surface towards a circumferential overflow weir.

The diagram shows high flow velocity (red vectors) along the inner surface of the COANDA tulip, moderate radial velocity (green vectors) underneath the water surface and high velocity at the weir. Velocities in the lower section of the grit washer tank are moderate to low (blue vectors).

The combined forces of gravity and inertia cause grit and heavier organic particles to settle out of the flow. They sink down to the lower section of the tank while light organic matter is carried with the water over the weir and returned (preferably upstream of the grit chamber). The excellent flow pattern in the COANDA grit washer leads to 95 % separation of 75 mesh grit particles (0.2 mm diameter).

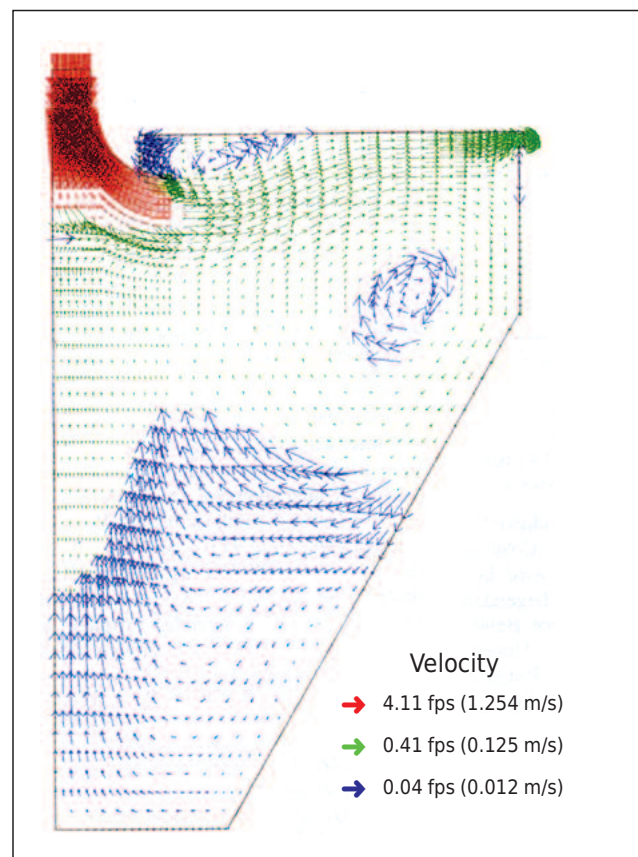
Fluidized bed for outstanding grit washing

The separated grit is then washed, i.e. attached organic matter is separated from mineral grit particles. This takes place in the bottom portion of the grit washer where a fluidized grit bed is generated. Wash water is fed into a bottom chamber that is separated from the grit washer tank by a perforated plate and a perforated rubber diaphragm. The wash water flows upward through the diaphragm and is evenly distributed over the bottom of the tank, thus generating a fluidized grit bed.

Within the fluidized bed grit particles rub against each other, thus removing organics from their surfaces. This process is supported by a central stirrer keeping the particles in motion. Particles in a fluidized bed are not separated by particle size, but by material density. The vertical water flow carries removed low-density organics vertically upwards towards the overflow weir while heavier grit particles remain within the fluidized bed.

The height of the fluidized bed is controlled with a pressure sensor. When it exceeds a certain height, washed grit is removed through the bottom. A rake moves the grit to a central vertical tube, connecting the tank with a screw conveyor. The grit drops into the inclined screw and is conveyed above the water level in the grit washer and drained by gravity. Washed grit drops from the conveyor into a dumpster.

From time to time organic particles stratifying in the conical portion of the grit washer tank are removed through a pipe returned to the wastewater upstream of the screens.

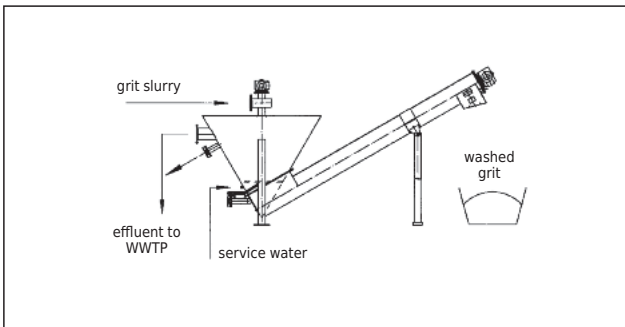


Flow velocities in the grit washer tank

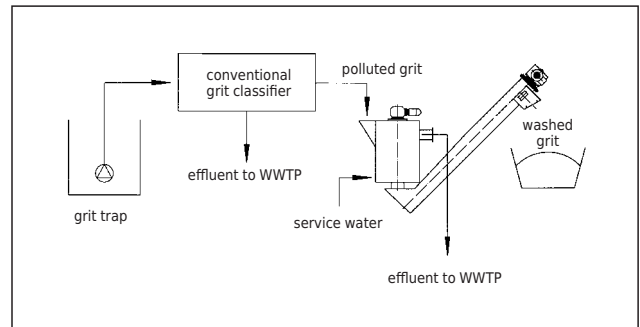


Washed grit of a wastewater treatment plant

Options for grit washing



RoSF 4 for liquid grit slurries



RoSF 4/t for classified grit or polluted grit from gullies and road sweeping



COANDA Grit Washer RoSF 4 / Size III with frost-protection for outdoor installation



Grit Washer RoSF 4/t fed with classified grit from a ROTAMAT® Complete Plant

Benefits

- Excellent washing of grit from grit traps, grit classifiers, sewer flushing, gully cleaning and road sweeping
- Insusceptible to debris of up to 2" (50 mm) size
- Over 95 % capture rate of 75 mesh (200 micron) grit particles
- Less than 5 % organics in product
- Less than 10 % water in product
- No attraction of disease conveying insects
- Virtually odorless product, reusable as construction material
- Mass and volume reduction by over 50 %
- Great savings of disposal costs
- Maintenance-free bearing of shafted stainless steel screw
- Made of stainless steel for long life
- Pickled in an acid bath for perfect finishing and corrosion protection
- Over 1,100 installations

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COANDA Grit Washing Plant RoSF 4